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Aquamarine crystal in matrix from Palmital mine, Conselheiro Pena, Minas Geraes, Brazil.

Courtesy Inter-Ocean Trade Company

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MAY - JUNE, 1954

(WHOLE NUMBER 240)

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ROCKS AND MINERALS

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ROCKS and MINERALS

PETER ZODAC, Editor and Publisher

America's Oldest and Most Versatile Magazine for the Mineralogist, Geologist, Lapidary.

Published Bi-Monthly

OFFICIAL JOURNAL

ROCKS & MINERALS ASSOCIATION

WHOLE NO. 240 VOL. 29, NO. 5 - 6 MAY - JUNE, 1954

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CHIPS FROM THE QUARRY

Coming Events

Midwest Federation Convention, Milwaukee, Wisc. (For information contact Dr. H. W. Kuhm, 4718 W. Lisbon Ave., Milwaukee 10, Wisc.) Dates June 24, 25, 26, 1954.

5th Annual Gem and Mineral Exhibit at the Veterans of Foreign Wars Hall, 119 E. Magnolia St., Compton, Calif., July 17, 18, 1954.

2nd Annual Gem and Mineral Show, Shrine Convention Hall, Los Angeles, Calif., Aug. 13, 14, 15, 1954.

Orange Belt Mineralogical Society 8th Annual Gem and Mineral Show, San Bernardino, Calif., Sept. 25, 26, 1954.

Eastern Federation Convention, Oct. 12, 13, 14, 15, 1954, Miami, Fla. (Executive Vice President in charge of Convention, Henry B. Graves, 3163 N. W. 27th St., Miami 42, Fla.).

Subscriber will exchange pulpits with Scottish Minister!

Editor R & M:

You will be interested to know that plans are working out for an exchange of pulpits with a Scottish minister, the Rev. William G. Tran, pastor of St. James Parish Church in Forfar (Forfarshire), Scotland.

Our ship reservations call for sailing from New York on Tues. June 29th, on "Georgic"; arrive in Southampton, Thurs. July 8th; be in the Forfar pulpit from Sunday, July 11th through Sept. 5th; sail from Southampton on "Georgic" Wed. Sept. 8th; arrive in New York on Fri. Sept. 17th; be in my own pulpit again, D. V., on Sept. 19th. It will make our children a week late getting into school. However,—!

Rev. Wm. J. Frazer
625 Main St.
Moosic 7, Pa.

March 4, 1954

Promised Specimens!

In my cabinet of mineral specimens is one empty shelf. This shelf is reserved for promised specimens. Yes, specimens promised by vacation trip visitors who willingly accepted my specimens and assured me that as soon as they got home they would send minerals from their state.

True some do send even more than promised but more forget completely. Think it over. Did you promise any last year or the year previous?

A sure remedy for this would be to pack a few specimens when you start on that next trip. Make your swaps on the spot. Save postage and your reputation and know that you will be welcomed back should you travel that way again.

A Faith losing collector

Picture on the cover.

The picture on the cover is a photograph of an unusual terminated aquamarine crystal in matrix which was recently obtained as part of an old collection from Brazil by Inter-Ocean Trade Company, 48 West 48th St., New York 36, N. Y.

The specimen comes from Palmital mine, Conselheiro Pena, Minas Geraes, Brazil, and the aquamarine crystal measures 6" in length and 1¼ to 1½" in diameter. The entire specimen stands 6½" high and is 5½ to 6" wide.

Fossil collectors, attention!

Editor R & M:

You asked me to drop you a little note regarding my proposition that I know the Helderberg area (around Albany, N. Y.) very well and could conduct parties there in search of fossils.

This I would be very glad to do at a nominal price. I could furnish transportation, also room and board for not more than four individuals.

Mrs. George Ellrott
New Baltimore, N. Y.

March 1, 1954

Agents we would like to have!

Editor R & M:

Have you ever considered the practicability of appointing agents in some of the larger cities to take subscriptions. I feel sure that most collectors would be glad to do this without any thought of pay other than the satisfaction that in this way they would be helping the publication.

C. O. Gettings
2001 Starr Ave.
Toledo 5, Ohio

April 19, 1954

Portable Geiger Counter Problems

By RONALD L. IVES

Introduction

During the last five years, a large number of mineralogists and geologists have considered the purchase of a Geiger counter, even though less than five percent of all minerals are radioactive to any appreciable degree, and large parts of the United States contain no radioactive minerals.

Commercially-built portable Geiger counters are now available in many designs, costing from about $40.00 up—mostly up. Some of these instruments, in all price ranges, are entirely workable devices, which will perform consistently as advertised. Some others, also in all price ranges, are not suitable for field use by mineralogists because of fragility, high battery drain, lack of sensitivity or too much of it, great weight, or undependability of operation. A number of the instruments which are merely high-priced pieces of junk in mineralogical field service are of definite value as portable instruments in a laboratory.

It is also entirely possible to make a portable Geiger counter, using standard parts commercially available. Cost of making a portable Geiger counter is from $40.00 up—mostly up; and only a very highly skilled technician can make a cheaper or better Geiger counter than he can buy!

Necessary Components

A conventional Geiger counter is a relatively simple electronic instrument, which consists of a Geiger—Muller tube, an amplifier, an output device, and a power supply. For field use, a protective case is also highly desirable.

Some of these components are relatively standard, and are best purchased "over the counter." Others are not only special devices but many alternatives may be used. These components will be very briefly described, with a summary of the merits and demerits of the various alternatives.

Geiger—Muller Tubes

A Geiger—Muller tube consists of two electrodes surrounded by a gas, usually at low pressure. One electrode, in many types, is a thin aluminum shell, which also forms the casing. The other is the central wire.

When a charged particle or a ray collides with an atom of gas within the Geiger—Muller tube, the atom is disrupted into two ions. One of these carries a negative electrical charge, and is usually an electron. The other ion, carrying a positive charge, is the rest of the atom.

When this occurs in the atmosphere, or in an ordinary evacuated chamber, in the absence of strong electrical charges, the two ions drift back together almost immediately, reforming the atom.

In a Geiger—Muller tube, a strong electrical charge exists between the two electrodes, being maintained there by the battery or other power supply. Under these conditions, the two parts of a disrupted atom do not drift together, but the electron is attracted to the positive electrode, and the positive ion (the remainder of the atom) to the negative electrode.

With a low voltage across the tube, such as 300, one electron reaches the center (positive) electrode per atomic collision. This produces such a small change in the electrical state of the anode (positive terminal) that detection of the results of collisions requires a large and complicated amplifier.

As the voltage across the Geiger — Muller tube is increased, the electrons released by an atomic collision in turn collide with other atoms, so that the electrical state of the anode is changed considerably as a result of a single collision.

Within a very definite high voltage range (usually from 800 to 1,000 volts), known as the *Geiger Plateau,* a single collision will produce a large number of secondary effects (the "Townsend Avalanche" of electrons), so that a very great change is produced in the electrical state of the anode.

With a further increase in voltage, the tube conducts continuously, like a neon

bulb, and is of no use as a detector of radioactivity.

If the Geiger—Muller tube is filled with a simple gas, such as neon, and the voltage is within the Geiger range, a single collision may cause it to start conducting, so that it will indicate only the first collision. Such a tube is known as a non-self-quenching tube, and requires some method of stopping conduction after each count. This may be done by inserting a very high resistance in the battery lead, so that continuous conduction is impossible. This procedure makes the tube insensitive to collisions for a definite time ("dead time") after each collision. Because a very high resistance, such as 50,000,000 (fifty million) ohms is needed to stop conduction, the dead time is so long that many counts are missed.

Automatic quenching can be performed electronically, with the dead time reduced to almost any figure but zero, by use of an auxiliary vacuum-tube quenching circuit, a device not desirable in field instruments because of increased weight and power demands.

By inserting small amounts of a complex gas into the tube, in addition to the simple gas, the tube can be made to quench itself, eliminating the need for either a high resistance in the supply circuit or a special quench circuit. Although self-quenching tubes have a shorter life than those which do not quench themselves, they are commonly used in portable equipment.

Geiger—Muller tubes become more sensitive as the diameter is increased, but also require higher supply voltages as they get larger, and the cost increases roughly as the square of the diameter.

Standard Geiger—Muller tubes cost from $3.50 up, and come in a wide variety of shapes, sizes, and sensitivities. For field use, one of the self-quenching type, designed to operate on about 900 volts, is practically standard. The Victoreen 1 B 85 Thyrode, costing about $7.50, is representative of this group. Where choice

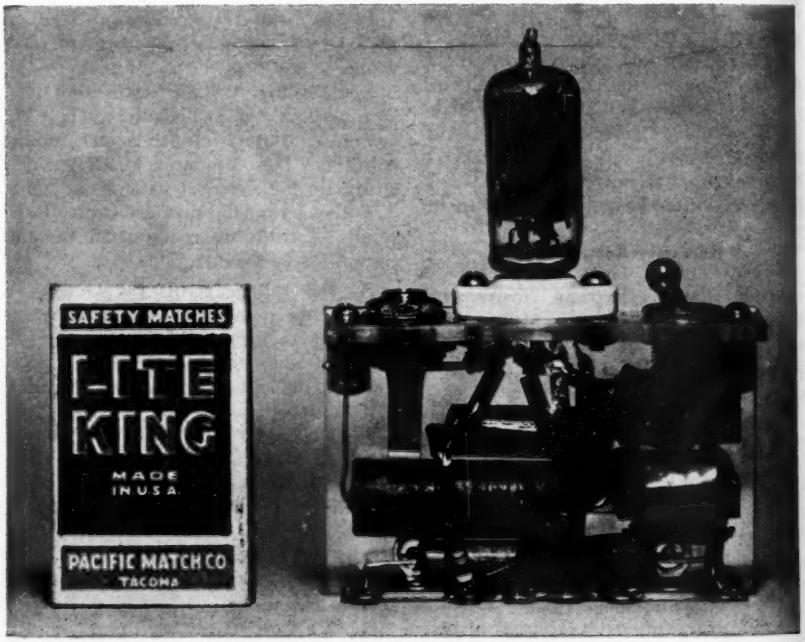


Fig. 1—Portable Geiger amplifier constructed entirely of standard radio parts. Match box at side gives scale. Smaller units are possible.

of tubes is possible, one with a "screw in" or "clip in" mount is preferable to one with "solder in" connections, as tube replacement is then possible in the field.

Geiger Amplifiers

A typical Geiger amplifier is a simple, light, and inexpensive device, consisting of a single small vacuum tube, and a number of small resistors and condensers. The Geiger amplifier differs from a standard radio amplifier only in that tone quality is not important, so that many components in a Geiger amplifier can be smaller, and hence lighter and cheaper, than those in a radio amplifier.

General appearance of a typical Geiger amplifier, constructed entirely from standard radio components, is shown in Fig. 1. Note the small dimensions of this amplifier, which weighs only 4½ ounces. If you have the skill, patience, and tools of a watchmaker,it is possible to build a similar amplifier small enough to fit inside a match box. Units of this type are already used in hearing aids.

Batteries to operate this amplifier consists of one 1½-volt flashlight cell, weighing 3½ ounces; and one 67½-volt "B" battery, weighing 13 ounces. Battery weight may be reduced somewhat by use of smaller units, at a great reduction in service life and very little reduction in cost. Because of the bulk of standard batteries—about 17 cubic inches—construction of a matchbox-sized amplifier results in little saving or either bulk or weight.

Circuit of the amplifier of Fig. 1 comprises Fig. 2. This is one of about a dozen standard Geiger amplifier circuits which perform satisfactorily, and was chosen because one side of input, output, and both batteries are grounded, reducing the danger of both shocks and short circuits to a minimum. This arrangement also permits grounding of one side of the Geiger—Muller tube and of its battery.

Output Devices

The simplest output device for a Geiger amplifier is a small neon lamp, such as the NE-2, giving 1/25th of a watt illumination, and costing about ten cents. This flashes once for each amplified pulse from the G-M tube. This indicator is not very satisfactory in the field, the illumination being too dim to see in bright sunlight.

Customary output device for a Geiger amplifier is a standard radio headset, which weighs about one pound, and costs from $3.00 to $25.00. Because standard headsets cover both ears, barring outside sounds, it is somewhat inconvenient for field use. Some field workers also report that a headset impairs their sense of balance.

Recently one manufacturer has supplied a "shoulder speaker" as the output device for a portable Geiger counter. This is a step in the right direction, but few amplifiers produce enough power to be heard dependably from a (variable) distance

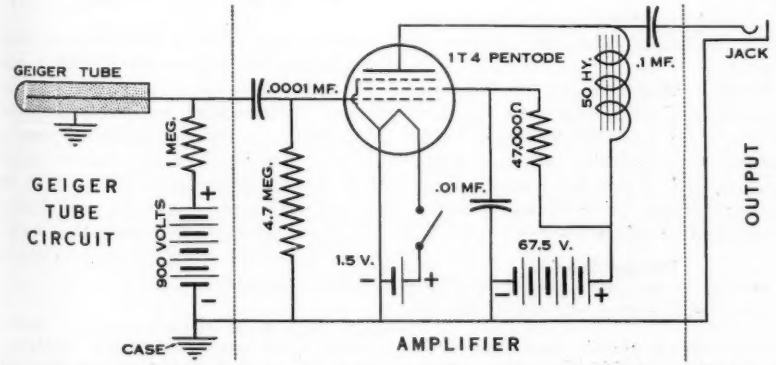


Fig. 2—Circuit of portable Geiger amplifier, showing connections to other components.

of about six inches, if any outside noise is present.

Perhaps the best all-around output device, and about the lightest which gives an audible signal, is a hearing-aid receiver, weighing about one ounce, and costing about $15.00. This device fits one ear, leaving the other free to hear outside instructions. An example of this type of output device is the Telex model 4650 midget earpiece.

POWER SUPPLIES

Introduction

Probably the most troublesome problem in designing a portable Geiger counter is that of obtaining the 900 volts required by the conventional Geiger—Muller tube. Although the current drawn from the power supply by the G-M tube is only a few microamperes (millionths of an ampere), the voltage must be instantly available, or the tube will not count.

Batteries

The simplest way of obtaining the 900 volts required for the G-M tube, as well as the 67½ volts for the amplifier plate and the 1½ volts for the tube filament, is from batteries. One set of batteries, under ordinary climatic conditions, lasts for about two years if unused (self life), and a lesser time if used. The 900-volt battery for the Geiger tube, which costs about $33.00, will last about three months if used continuously, about six months if used three or four hours a day, and its shelf life (about two years) if used an hour or so a week. The other batteries, which cost very much less, have an equivalent shelf life, and a much shorter service life.

When a portable Geiger counter is used for periods of more than about ten hours a week, *every week,* battery supply for all components is probably the most economical method. A portable counter of conventional design, using all-battery supply, is described by W. B. Ford (1).

Vibrator Supplies

Because of the cost, weight, and bulk of a 900-volt battery for the G-M tube circuit, various methods have been employed to produce the high voltage from a low voltage source. One of these alternative supply methods is by use of a vibrator, which converts direct current, supplied by the battery, into alternating current. This is then stepped up to a high voltage by use of a transformer. The high voltage A-C is then rectified (made into direct current again), after which it is fed through a filter to the G-M tube.

Circuit of a conventional vibrator, transformer, and rectifier high voltage supply for a portable Geiger counter is shown in Fig. 3. Here, the vibrator transformer supplies not only the high voltage required by the G-M tube, but also a low voltage, at very low current, for the rectifier filament. This eliminates the need for a separate rectifier filament battery, which is 900 volts or more above ground when the power supply is operating.

The vibrator proper operates in the same fashion as a "doorbell" type buzzer. In some instances, vibrator and transformer are made as a single unit, as in the Model T Ford ignition coil (2), which has been used as a Geiger tube supply.

First cost of a vibrator power supply for a G-M tube is about one fifth that of a 900 volt battery; bulk is about the same; and weight can be considerably less than the 51 ounces of the smallest commercial 900 volt battery (3 Eveready #493—300 volt batteries at 17 ounces each).

Operating cost of a vibrator power supply is less than that of an all-battery supply only when use is occasional, so that "shelf" deterioration is considerable. Under other conditions, operating cost is greater than for batteries, for the vibrator, transformer, and rectifier are by no means 100 percent efficient, the rectifier filament consumes more power than the G-M tube, and the voltage regulation system

(1) Ford, W. B. *Build Your Own Geiger Counter,* Radio and Television News, Vol. 42, 1949, p. 34 et. seq.

(2) Camp, R. B. *Portable Geiger — Muller Counter for Locating Lost Radium,* in Markus, John, and Zeluff, Vin. *Handbook of Industrial Electronic Circuits,* New York, 1948, 62-63.

(bleeder resistor) requires power at all times.

Offsetting many of these disadvantages is the easy availability of standard flashlight cells, two of which are used in most vibrator type Geiger counters, and the low cost of a set of replacement batteries. An example of a conventional vibrator-type Geiger counter is the Nuclear Instrument Co. "Sniffer."

"Flyback" Supplies

Because of the relatively large power requirements of the vibrator of a vibrator-type power supply, and the large filter needed to smooth the rectifier output, various high-frequency oscillators have been used to produce the alternating current needed for stepping-up and rectification for the G-M tube supply.

Simplest, and least dependable, of these devices consists of a radio-frequency oscillator, feeding a transformer constructed like a Tesla coil, which in turn supplies high voltage to a rectifier and filter.

Less simple, but more dependable, is the combination of a "sawtooth" oscillator and an inductance, which supplies high voltage to the rectifier. This operates on the principle that when stored magnetic energy is released suddenly, it will induce high voltages in a suitably designed coil.

Diagram of a fairly standard "flyback" high voltage power supply constitutes Fig. 4. Here, the oscillations are produced in the neon tube circuit. Voltage from the "B" battery flows through the high resistances (1 meg, 10 meg) into the small condenser (.00005). When the voltage across the condenser reaches the striking voltage of the neon tube (NE—about 90 volts), the tube becomes a conductor, draining the condenser almost instantaneously to the extinction voltage of the tube (about 65 volts). At the extinction voltage, the tube becomes a nonconductor, and the condenser recharges slowly, through a series resistor, to the striking voltage, and repeats the cycle. In consequence of this action, the left plate of the .001 MF. condenser, coupling the neon oscillator to the grid of the amplifier drops 25 volts in potential, suddenly, once each cycle.

Because a change in the potential on one plate of a condenser produces a like change in that of the other, the grid of the amplifier, directly connected to the right plate of the .001 MF. condenser, goes 25 volts negative with respect to its former potential once each cycle, causing the plate current of the tube to decline suddenly.

When this occurs, the magnetic field

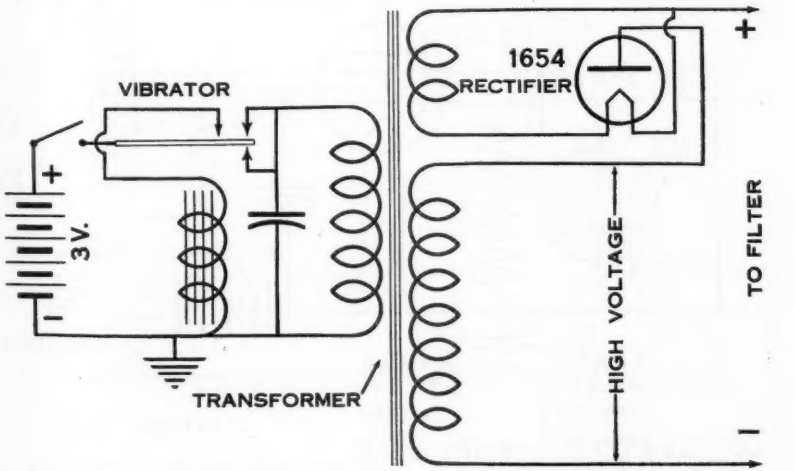


Fig. 3—Vibrator, transformer, and rectifier for obtaining high voltage from a low-voltage battery.

built up by the plate current of the tube through the plate inductance, collapses very suddenly, and, in so doing, induces a very high voltage (the "flyback voltage)" in the plate inductance. This is applied to the plate of the amplifier tube, which at this instant is a very poor conductor. In consequence, a major part of the flyback voltage goes through the rectifier, which acts as a one-way valve, into the filter.

Conduction through the grid resistor and from filament to grid within the vacuum tube rapidly restores the right plate of the coupling condenser to its former potential, and the tube conducts again, building up a magnetic field in the plate inductance, ready for the next cycle.

Operating frequencies of about 5,000 cycles per second are common with this type of power supply, and the voltage produced across the filter output, within rather wide limits, is a function of frequency. Thus, by adjusting the series resistor (10. MEG., Fig. 4), the oscillator frequency can be changed, and with it the G-M tube voltage. This is a convenient way of compensating for declines in battery voltage with age and use.

Flyback power supplies, using a neon oscillator, require about 125 volts of plate supply, but both plate and filament batteries of the oscillator can be shared with the amplifier of the G-M tube circuit (Fig. 2). A small filter (1 MEG.; Cf, (Fig.4) is commonly used to keep the oscillator frequency out of the amplifier. Weight and bulk of a flyback power supply are comparable to those of the vibrator type supply, and costs are quite similar. Maintenance cost of a flyback supply may be slightly lower than that of a vibrator supply, for the oscillator element, commonly a NE-2, 1/25th watt neon bulb, costs about ten cents, whereas a vibrator costs about $3.00.

One of the better commercial instruments using flyback supply for the G-M tube is the Forty-Niner, produced by the Forty-Niner Corp. of Detroit.

Filters

Voltage output from any high voltage employing a rectifier is not pure direct current, but varies greatly in magnitude. The G-M tube, however, requires a constant voltage to have constant sensitivity. To smooth out the variations in the rectifier output, some sort of filter is necessary.

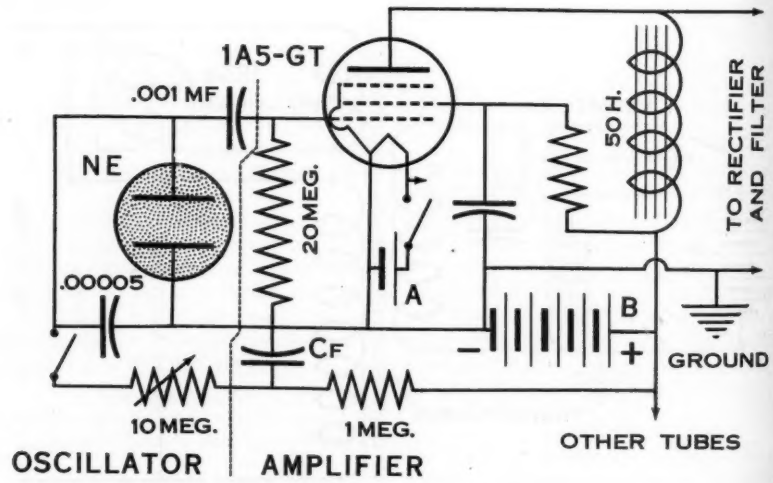


Fig. 4—"Flyback" power supply circuit.

A filter is merely an electrical smoothing and stabilizing device, consisting of one or more storage components (condensers), and a connecting link which slows down the flow of current between input and output. These links are commonly inductances when current flow is great, and resistors when current flow is small (as in Geiger counters). Samples of single section filters of both the inductive (L-C) and resistive (R-C) types are shown in Fig. 5. Representative component values for resistive filters for Geiger counter use are: condensers , 0.01 MF, 1,000 volt; resistor, 0.25 to 1.00 megohms. Additional filter sections can be used for greater smoothing of output, if desired.

Because the load on the high voltage supply of a Geiger counter is not uniform, while the power input is, there is some danger that the voltage across the filter condensers will rise to a high or even dangerous value during intervals with below-average incoming radiation. To prevent such difficulties, a high resistance, such as five megohms (5,000,000 ohms), is connected across the output. This, known as a bleeder resistor, stabilizes the filter voltage, preventing it from rising to dangerous levels. In addition, the bleeder resistor drains the filter slowly, when the Geiger counter is turned off, so that the condensers will not give dangerous shocks when handled. Note that this draining of the filter is *slow,* taking some minutes.

Power Supply Summary

Three types of power supply are in common use with portable Geiger counters. All of them, in carefully-designed equipment, work well and with considerable dependability. All of them are expensive in either first cost, or operational cost, or both, the optimum type being

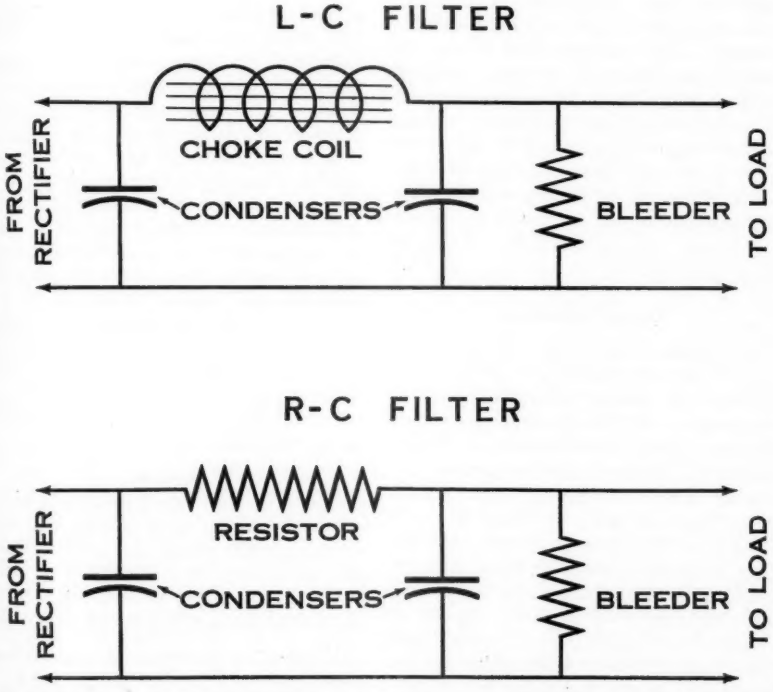


Fig. 5—Sample filter types. Inductive, or L-C type above; resistive, or R-C type below.

determined by the relation between exhaustion of batteries due to amount of use, and deterioration of batteries due to non-use and age. For a Geiger counter that is to be used frequently, there is no question that all-battery supply is most economical, insofar as cost per hour of operation is concerned, despite high first cost. For Geiger counters that are to be operated infrequently, overall operating cost is probably lowest with either a vibrator or flyback power supply, which is lighter and cheaper in first cost than a complete set of batteries, but costs more per hour of use. Choice of type here is a matter of personal preference, both types, when skilfully constructed, giving satisfactory service.

FUTURE DEVELOPMENTS

Introduction

Despite several rather ingenious methods of avoiding the high first cost of batteries for high voltage supply, it is still quite difficult to generate a dependable, constant, high voltage from a low voltage source efficiently. In most instances, the generating device consumes more power in operation than it transforms from low to high voltage, and is subject to great output variations as a result of rather small variations in battery voltage. Several new developments, still in the laboratory stage, offer a possible solution to these problems.

Voltage Regulators

To maintain the high voltage supply for a G-M tube constant, a bleeder resistor across the filter is commonly used. Unfortunately, rectifier outputs sometimes fluctuate beyond the ability of a bleeder to control. To compensate for greater fluctuations, which may damage either the filter or the G-M tube, the Naval Research Laboratory has recently developed a hydrogen—helium corona discharge tube, of small weight and dimensions, which will hold the output of a power supply to within 10 volts of 1,000 when the input varies from 5,000 to 1,200 volts. Such a regulator is ideally suited for use in portable Geiger counters (3).

Selenium Rectifiers

The power consumed by the filament of the rectifier is about as great as the power supplied the Geiger—Muller tube, in most power supplies. In addition, the rectifier of the high voltage supply requires either a separate battery, involving an insulation problem (flyback supply) or a special winding on the vibrator transformer (vibrator supply).

Recently, high voltage selenium rectifiers, which require no filament supply, have been developed by the Federal Telephone and Radio Corp. Such a rectifier, suitable for high voltage supply for a G-M counter, requires no filament voltage, weighs about two ounces, and costs about $9.00. Future price reductions, resulting from quantity production, may make this type of rectifier available for use in portable Geiger Counters, with a resultant great increase in power economy.

The Scintilloscope

Within the past few years, as a result of researches by the Radio Corporation of America and the Signal Corps General Development Laboratories, an entirely new radiation detector has been developed. This, called the *Scintilloscope,* is actually an electronic spinthariscope. In this instrument, radiation falls upon a special fluorescent screen, causing it to glow weakly and momentarily. This glow is detected by a sensitive photoelectric cell, the output of which is amplified, and fed to any convenient output device. The *Scintilloscope,* although not, in its present form, quite as sensitive as a Geiger counter, requires no high voltage battery or special supply: can be made for about the same price as a Geiger counter; and will probably cost less per hour to operate in the field.

Conclusions

The many and varied designs of Geiger counters indicate quite plainly that there is no one best design for either field or laboratory use. In a general way, dollar for dollar, nothing is saved by attempting to build a Geiger counter of any con-

(3) Blifford, I. H., Arnold, R. G., and Friedman, H. *Corona-Tube Regulators for High Voltages,* Electronics, Vol. 22, No. 12, Dec., 1949, 110-111.

ventional design. The simplest commercial counters of sound construction cost about $40.00, and the parts, at standard prices, for construction of a similar counter, cost about $40.00. This price may be reduced by the use of war surplus parts, but replacement of such parts, a few years from now, may be very costly indeed.

Type of output device is a matter of personal preference, and may be varied within wide limits even with factory-built equipment.

Power supply type is a matter of expected use, in hours per week, and is determined by the relationships between first cost, battery depletion rates, and shelf life of batteries. A secondary consideration, for those who go into isolated locations, is the availability of the special high-voltage batteries needed in all-battery powered counters. Standard flashlight cells are available at stores in most inhabited places; small "B" batteries can be purchased only in medium—sized towns; high-voltage batteries are unavailable "over the counter" in many places with a population of as much as 100,000. Could you get them at all, at any price, in Kuwait?

LAKE TO BE DRAINED FOR ASBESTOS MINING

At a recent press conference in Quebec City, Canada, a provincial cabinet minister, Hon. Tancrede L'Abbe, revealed plans for a $20 millions lake-drainage project financed by U.S. interests to initiate mining of a series of asbestos deposits which, he stated is "believed to be the largest in the world today." After the news conference, an administration spokesman forecast that, "within the next few days" the Quebec Government was expected to issue a special Order-in-Council giving a green light to the whole undertaking.

"At least 50 million tons of ore have been confirmed below the waters of Black Lake in Megantic County which will be drained to turn the hidden deposits into an open-pit project," Hon. Mr. L'Abbe said. "Plans for the lake drainage and the creation of an artificial lake about one and a half miles downstream as well as controlling dams have been filed and accepted by the authorities."

The Quebec cabinet minister stated that the U.S. interests concerned were American Smelting and Refining Company which organization is spending the $20 millions required to bring the deposits to production. He described the program as the first major investment in Canada by this outstanding U.S. mining organization. Development of the Black Lake underwater deposits had been initiated and carried to this stage by United Asbestos Corporation Limited, Toronto and Montreal. The American and Canadian corporations will operate jointly, it is stated.

The first mill to be erected on the property will have a capacity of 5,000 tons per day, Hon. Mr. L'Abbe said.

"This production will be increased as time goes by," he added. "Companies such as American Smelting and United Asbestos would not invest capital above the $20 million bracket without being assured that they will remain permanently here and continue to expand."

(Canada has long been the world's leading producer of asbestos and supplier of practically all U.S. needs as well as 70 percent of the free world's requirements. Most of this output comes from a small section of Quebec, close to the Vermont border, the Black Lake-Megantic-Thetford Mines region. The world's largest asbestos mines and mills are located here. The United Asbestos property has been described by Canadian mining authorities as the only important new discovery in this established producing area in more than a quarter century. While the Black Lake deposits are as yet only partially explored, more than three miles of underground workings have been completed beneath the lake as well as very extensive programs of diamond drilling, much of this from the ice of the lake in winter).

"POP-STONES" FROM CHESAPEAKE BAY

HERBERT O. ALBRECHT **
Springfield, Delaware County, Pennsylvania

Mr. Clayton Hamilton, a fellow-member of the Philadelphia Mineralogical Society, and an amateur archaeologist of distinction, showed me some hollow, spherical, completely closed, limonite concretions the size of marbles, from the estuary of the Northeast River, Chesapeake Bay. He said these curiously uniform objects were called "pop-stones" by the children who picked them from the beach, because they exploded violently when put into the fireplace. I convinced myself very satisfactorily of the accuracy of this by holding a few with tongs in a bunsen flame (wearing goggles).

The explosion is, of course, due to steam from the damp sand in the interior, and indicates that the shells, about 2 millimeters thick, are very strong and impervious. However, on storage in a dry place the internal moisture and capacity to "pop" are lost.

Inquiry, and my own efforts to learn more about limonite concretions by field study, have revealed no other place where the pop-stones occur in quantity. Irregular tube-like concretions after pyrite are frequent in the Magothy (upper Cretaceous) and some other formations of the Coastal Plain, but these are very seldom completely closed and thick-walled throughout. Dr. J. T. Singewald, Jr., of the Maryland Department of Geology, says that geologists find spherical concretions from time to time, but apparently not in conspicuous quantity at any one place. His department is not familiar with the pop-stone locality.

Because these objects are picked up only from the door-yards of summer dwellers, I should feel unjustified in giving the exact locality. However, I shall be glad to suggest to anyone particularly interested where permission to gather them might be obtained. Those who gave me this permission, I thank heartily for their courtesy.

The uniformity of the pop-stones suggested a fossil origin, especially as I could imagine no inorganic conditions under which limonite (or pyrite) could be deposited in hollow shells of nearly perfect symmetry. I got no support for this view from any quarter, including Dr. Horace Richards of the Philadelphia Academy of Sciences and Dr. Singewald. My wife, however, suggested sea-weed bladders and Mrs. W. Hersey Thomas suggested ascidians. Fossil nuts or the like were just too pat to be true.

Sea-weed bladders do indeed grow in the thallus in a way to account for the slight fins on many of the pop-stones, though I could find no record of species with strictly globular air bladders. Working on this lead, I imagined the weed to be buried, the bladders eventually to split and fill with sand, and with decay setting in, the organic matter to reduce sulfate and iron solutions to pyrite. Weathering at a later age would transform the pyrite shells to limonite.

Very pretty—and as good as many another speculation on concretions. But even after much effort, the hypothesis wouldn't quite click in the details. Rather unhappy about scrapping my wife's bright idea, I found myself too susceptible to general appearances, as I think were Franz and Hill when they regarded as fulgurites, limonite tubes which were probably root casts (R and M, Sept.-Oct. '48; Nov.-Dec. '49). Only in my case, I said "fossil" and had eventually to settle for an inorganic origin, whereas with them I think the reverse will prove to be the case.

My conversion was due to a study of references kindly suggested by Dr. Singewald'* I recommend these to people interested in the many amazing forms—not only of limonite—embraced by "concretions". Nowhere were pop-stones explicitly described, though Merrill has an illustration of a quintuple aggregate (Plate VI, Fig. 1). He did emphasize in my mind what I already knew, but not well enough: that solid pyrite can give hollow, as well as solid, limonite pseudomorphs. I knew of perfect pyrite balls; I had only

to imagine large numbers of nearly the same size in one place. Then I realized, belatedly, that the "bumps" on some of the pop-stones were the trace of relatively large projecting pyrite crystals and that clinched the matter.

From one set of difficulties to another, the reader may say. What makes pyrite balls, what would produce quantities of the same size, and how does a pyrite ball weather to a hollow impervious mass of limonite half-filled with sand?

Yes, difficult questions, but about actual—not hypothetical—occurrences. That is the great advance over the idea of fossil origin. After considerable observation of the Coastal Plain strata and study of their chemistry, I believe I can contribute a new point or two to the origin of these pop-stones. To consider the reasons for rejecting the many alternate possibilities, or even to list them, would take much space, so I content myself with a didactic-sounding description of what I think took place.

In a body of fine pure sand or clayey sand, such as occurs at the base of the Magothy, a few well-spaced nuclei—say magnetite grains — were present. This sand lense, below the water table, was permeated from above by an iron solution (consisting of basic ferric sulfate) and from below by hydrogen sulfide. This did not occur until after elevation of the sediments, because the formation of iron sulfates require slight oxidizing conditions part of the time, as well as circulation. (In fact, I assume a previous cycle of pyrite formation and destruction in overlying layers.) Under conditions so nearly static that diffusion of iron sulfate to the nucleus depleted the surrounding sand of most of its iron for an inch or two in all directions, the

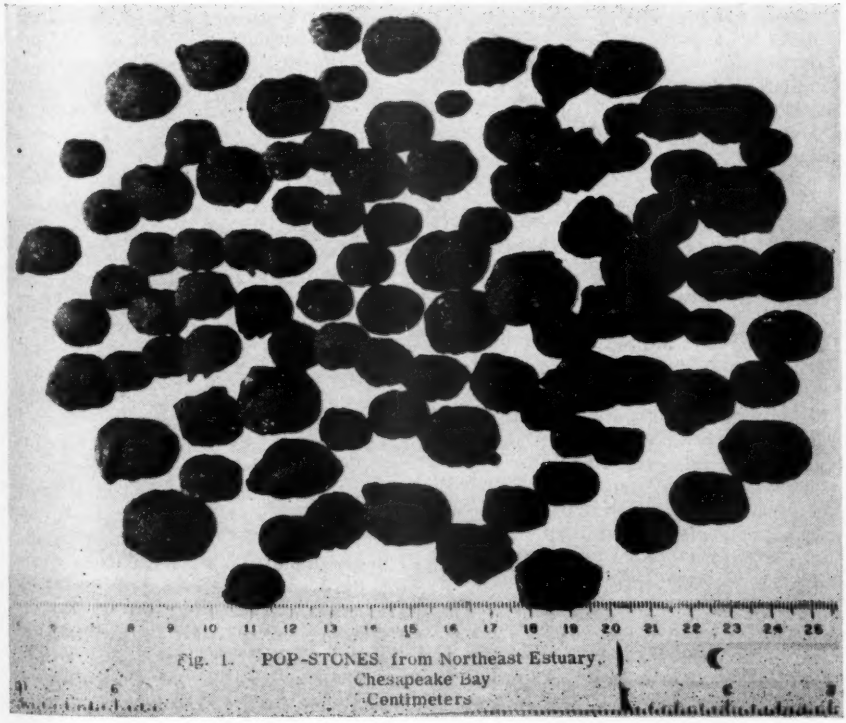


Fig. 1. POP-STONES from Northeast Estuary, Chesapeake Bay

growth of the pyrite crystals was uninfluenced by currents, and the sand being uniform, spherical aggregates were the result.

At first tiny crystallites formed near the nucleus, rather than a single crystal, due perhaps to interference of the sand grains. Thus for a time the pyrite continued only to grow within the spaces between the sand grains. As the radius of curvature increased, as new nuclei ceased to break loose, and as possibly interfering impurities were enclosed by the first crystals, conditions became favorable for the growth of crystals which could bridge the sand grains and thus push them aside by "crystallization pressure". From there on a compact radiating structure containing little sand developed. (All this is visible in the so-called "pyrite suns". On the other hand, the more perfect balls sometimes found, which radiate from almost the very center, were formed in finer material such as pure clay. Some interference was present, I submit, or multiple nuclei at a point originally existed, to account for any radiating aggregates of crystals—otherwise we get merely single crystals, or granular or coarse, helter-skelter, aggregates).

As for the uniform size of the pyrite balls under consideration, it does indeed call for postulating a remarkable number of constant factors over perhaps a long period of time. However, in accounting for natural phenomena of this kind we can avoid the frequent error of Darwin's opponents: We are not first dreaming up a set of conditions, and then going out to try to find them realized—our chances would then be small enough. Rather, we are *accidentally confronted* with a *curious unexpected fact*—the conditions responsible in such case could well have been exceptional, or beyond our spontaneous imagination. It is a rule of laboratory science to seek the nearest, simplest explanation as the likely one. Nature, with her unbounded resources of time and space and forces has her own ideas of "likely" which seem at times to invite loose thinking, and actually require the opposite in order not to be led astray.

We now have a lot of pyrite marbles distributed in sand, and with granular, sandy interiors. By leaching, or real or relative lowering of the water table (rise of the land) they become exposed to air or oxygenated waters. (It seemed so difficult when I was pondering diffusion through soft limonite envelopes, and what not—but it proves so easy!) The shells just rusted and cracked by the corrosion and expansion along crystal boundaries! The fine pyrite in the interior was exposed and dissolved or reduced to a rusty suspension which trickled out before the big exterior crystals were rusted through. The further corrosion of the latter recemented the cracks when the expansive forces were spent with the exhaustion of the pyrite. The "fins" and "stems" were formed, I think, at this stage, due to a fissure produced by expansion in the matrix which acted as a mold. (See Fig. 2). Unfortunately, the pop-stones have not been seen in the matrix, but other pyrite concretions are often in a fissured matrix. Indeed, their formation must parallel that of the pop-stones for the most part. These irregular concretions raise more critically the question whether they started because of (1) the presence of nuclei, or (2) an open space due to decomposition of organic matter, or (3) the actual chemical contribution of such decomposition products to the reduction of sulfates and ferric iron.

In conclusion, I would offer some suggestions about the chemistry of pyrite formation. This presents some difficulties since pyrite, a polysulfide, is not dissolved as such, unless in the minutest concentrations, in cold water, and crystallizes only very slowly, or under very restricted conditions, despite being such a ubiquitous natural product. The details of the original reduction of sulfate ion in sea water to sulfide by organic matter is still an enigma to me, and I believe to geologists. I know of no laboratory reduction under the mild temperatures and pressures of Cretaceous and later deposits. If this reaction is promoted only by bacteria, the chemistry may be as complicated as that of muscle-metabolism, the elucidation of which won a Nobel Prize. Once formed,

the sulfide, and especially the free, or slightly bound, sulfuric acid resulting from its reoxidation can and probably do go through numerous cycles, together with ferrous and ferric iron, at nearly the same place and time, geologically speaking.

All the other reactions it seems necessary to assume in pyrite formation, and weathering in general, are presumably reproducible in the laboratory, though perhaps not actually demonstrated in every case. It is an interesting speculation whether a great melange of materials and reactions, such as occur in many relatively fresh sediments, plus an abundance of time, can perhaps simulate the life-processes by the occurrence of reactions not otherwise observed. Such reactions are energetically possible, but their activation energies are ordinarily too high, and must be gotten around by elaborate catalytic subterfuges.

Pyrite undergoes a kind of autolysis, or self-accelerating destruction (of ill-repute among collectors) when exposed to air, because of the water-attracting and acid nature of the products. Strangely, this may be the best approach to the *synthesis* of pyrite at ordinary temperature, since some of the reactions are probably reversible:

(1) Pyrite + 3 1/2 oxygen + water = ferrous sulfate + sulfuric acid

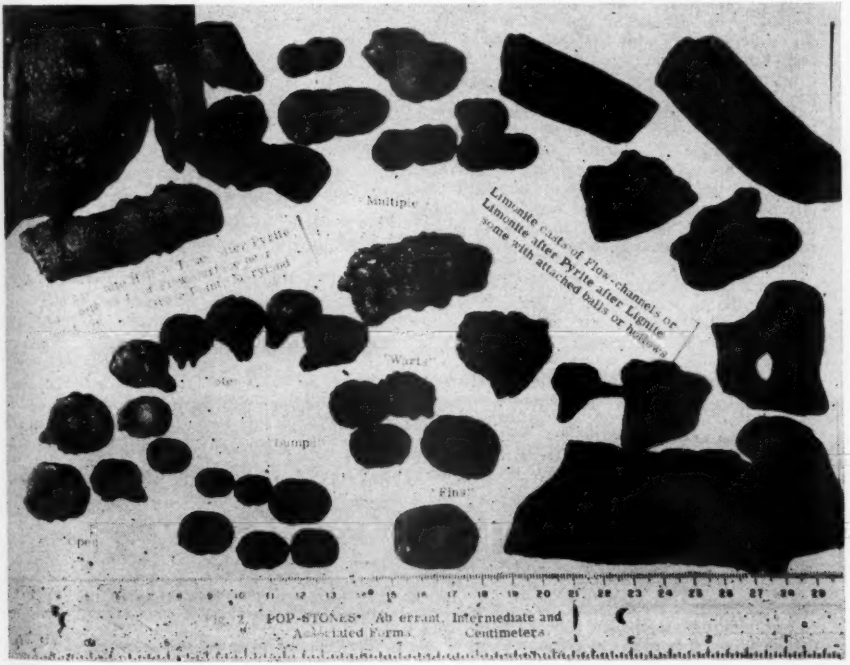
(2) Pyrite + ferrous sulfate + 4 water = basic ferric sulfate (or limonite + sulfuric acid) + 2 hydrogen sulfide

(3) Pyrite + basic ferric sulfate = ferrous sulfate + 2 ferrous hydroxide + 2 sulfur

(4) Pyrite + 3 ferrous sulfate = ferric sulfate + 2 ferrous sulfide

(4a) Pyrite + 3 ferrous sulfate + 3 calcite + 3 water = 2 limonite + ferrous sulfide + 3 gypsum + carbon dioxide

When the products on the right of equations (2), (3), and (4) occur in relatively high concentrations, because of destruction of a previous overlying generation of pyrite, or otherwise, or physical



conditions become more favorable, pyrite may crystallize. In fact, alternation of conditions may be a characteristic part of the whole weathering scheme, rather than a steady-state process, since the most favorable ingredients for the formation, say, of pyrite, may be produced only by mutually incompatible reactions. (For example (4a) to the right followed by water leaching, then by some oxygenation and (3) to the right, the final stage being $FeS + S = FeS_2$). (Incidentally, all of the foregoing applies also to marcasite; there seems to be a tendency to call all low-temperature iron disulfide marcasite, though I have not yet recognized it in the Coastal Plain and believe it uncommon).

Further discussion would be rather specialized. I believe I have shown that the "simple" chemistry and mechanics of pop-stones and their environment have some intriguing and even fundamental philosophical aspects.

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* George P. Merrill, U. S. Nat. Mus. Proc., 17, 87-88 (1894).

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E. M. Kindle, Geol. Soc. Am. Bull., 43, 609-647 +8 plates (large bibliography).

R. L. Bates, Tour. Sedimentary Petrology, 8, 91-99 (1938).

** Physicist, Bartol Research Foundation, Swarthmore, Pa.

New Use For Barite

Akron, O. — The rumbling of a small, unique plant down among the foothills of the Ozark mountains may cause an eruption which would blast loose restrictions holding back long-needed improvements in our highway system.

This is the capsule summary of road-building experts speculating over the possible effect Rubarite will have on future highway construction.

Rubarite is the trade name of a free-flowing powder which consists of unvulcanized synthetic rubber and barite. The barite, when reduced to fineness, serves as a carrying agent for the rubber particles, keeping them effectively separated and thus providing a high degree of dispersion. This, in turn, provides for smoother blending when finally mixed with asphalt.

Also, the barite is used in place of other possible fillers because of its outstanding affinity for asphalt.

Production of Rubarite is being carried out in Magnet Cove, Ark., by the only plant of its kind in operation today. Rubarite, Inc., the company which produces Rubarite, is owned jointly by The Goodyear Tire & Rubber Company, The National Lead Company, and Bird & Son, Inc.

Use of rubber in roads is not new, but practically all of the previous paving applications have been with vulcanized rubber. Rubarite represents the first successful mix with unvulcanized synthetic rubber. It is produced by co-precipitating synthetic rubber latex and extremely small particles of barite.

Principal advantage of using unvulcanized rubber is that it disperses more readily in the asphalt—making it more effective in improving the asphalt's properties.

The barite used in production of Rubarite was a waste material prior to the development of the new product. Heretofore, when the barite ore was blasted from the earth ,it went through a purification process and was separated into two grades, coarse and fine.

The coarse grade has long been used in oil drilling muds as a weighting material while the fine effluent was being discarded. It is this portion, for years considered worthless, that is such a vital component of Rubarite.

Results from a number of Rubarite test installations made in different parts of the country appear to be justifying the most optimistic predictions of street paving specialists.

Thus far, the test roads—located in Arkansas, Missouri, Illinois and Wisconsin—are showing evidence of four major improvements over conventional paving materials:

1.—Superior ability to withstand changing weather conditions;

2—Rugged durability to wear longer under the unceasing pounding of modern-day traffic;

3—Greater resistance to stripping, to oxidation in thin films and to bleeding; and

4—Reduced maintenance costs.

THE SEPTARIA OF BARE HILL

By DAVID E. JENSEN

Geological Division, Ward's Natural Science Establishment, Rochester, N. Y.

The Finger Lakes region of central New York state is rich in geological history and Indian legend. Good mineral localities are rare. Yet in one narrow east-west belt, interesting calcite crystals may be found inside of cavities of the concretions and septaria that abound in the sandy shale strata.

Canandaigua Lake, often called "Queen of the Finger Lakes", is the westermost or "little finger" of the five Finger Lakes. Starting at the town of Canandaigua, it stretches south-southwest about 20 miles to nestle in the scenic vineyard dotted hills just north of Naples village.

This lake, along with its sister Finger Lakes, occupies one of the main branches of a dendritic river system that drained the central New York area in Pre-Glacial times. The river branch that occupied what is now Canandaigua Lake flowed south, then westward a short ways to turn north and join the Pre-Glacial Genesee River.

Some 25,000 years ago, the great continental glacier moved southward over New York State into northern Pennsylvania. Tongues of the glacier moved more easily in the river valleys. Here and there the glacier ice scraped and scoured the sides and bottoms of these valleys.

Then, as the climate gradually grew warmer, the ice began to melt and the glacial lobes receded northward. As the ice melted, the rock and dirt debris that has been picked up on the glacier's south-

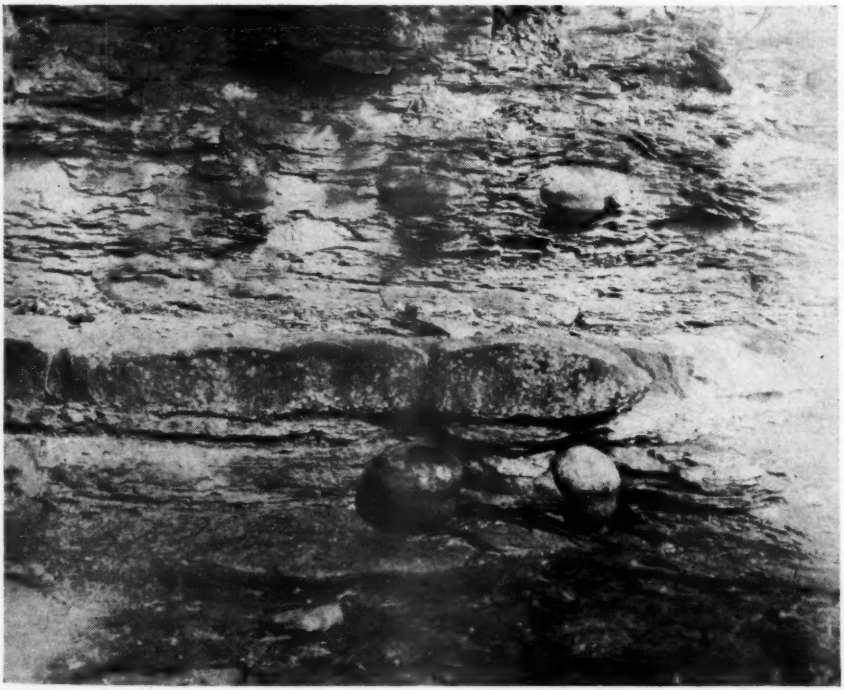


Fig. 1) Septaria partly exposed in shale bank. Water's edge is at base of lower two.

ern travel, was now carried south by streams of water flowing from the melting ice. By circumstance, heavy loads of this rock and dirt material were dumped in the river valleys in such a way that dams were formed which prevented further southward flow of the rivers. The water backed up by these moraine dams filled the river valleys and formed the beautiful inland lakes which are now a summer vacationist's mecca, thanks to a provident glacier and several overloaded, tired glacial streams which dumped their loads in the right places.

About 10 miles south of the town of Canandaigua, on the east side of the lake, Bare Hill rises some 900 feet above the water's edge. As its name suggests, the hill's slopes are relatively bare, but for a few small woodlots. There is little farming except for occasional sheep pastures and small vineyards. As one early settler said in 1832, "the (land) . . . is so poor that nothing but eagles and angels can live there." Actually the most fertile soil had been scraped off by the glaciers to be replaced by a thin veneer of glacial mud mixed with the unfertile residual clay of the weathered shales of the hill.

At the foot of Bare Hill, the lake shore is lined with summer cottages and the homes of a few year-around residents. The banks are quite steep and cliffs of shales and shaly sandstones rise as much as 100 feet from the water's edge. It is in these cliffs that the concretion-bearing strata are well exposed. As the rock layers dip south about 20 feet to the mile, the concretion-bearing layers gradually disappear under the water.

The shale banks are easily eroded. Each winter, water seeps down fissures and joint planes, freezes, and shoves the outer rock outward. As the rock gradually falls away, the concretions that have been previously exposed fall out and roll down the banks, sometimes into deep water. And new concretions become uncovered.

When the concretions first weather out of their shale tomb, they are quite smooth and round-like flattened melons. Sizes range from a few inches to 2 feet or more in diameter. The average size is around 10 inches. After years of subsequent weathering, some of the concretions will de-

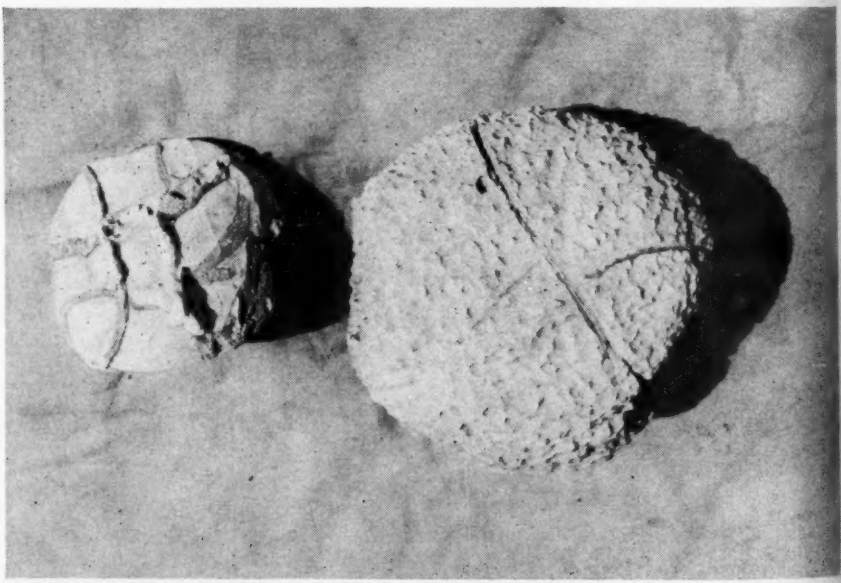


Fig. 2) Weathered septaria. The larger one was taken from the lake bottom, 8 feet below water.

velop unusual surface patterns. Apparently when the concretion was an unconsolidated mud ball, it dried out suddenly and cracked, like mud will crack when dried rapidly in the sun. These cracks become filled with carbonate waters from which calcite (and rarely celestite) crystallized to fill and cement the concretions. Often the calcite is darkened by organic materials. As the calcite is more resistant than the lime shale of the concretion, the calcite veins stand out in relief after weathering.

The name septarium (plural - septaria) is derived from the three dimensional pattern formed by the calcite veins. Sometimes the surface pattern is quite regular and symmetrical giving rise to popular names such as "turtle stones" or "petrified turtles". When a septarium is broken open, cavities lined with small dog-tooth calcite crystals may be found.

A few concretions have been brought by diving, up from deep water where they have rolled. Many of these have a most unusual pitted surface. This is possibly caused by differential solution under water, but no completely satisfactory explanation has been advanced.

The concretion-bearing strata are found on the opposite side (west side) of the lake and still further to the west, wherever the same strata are exposed.

The Indian legend that explains the origin of these unusual concretions is most interesting even though it does not jibe with the geological story. According to the myth of the Senecas, their tribe sprung out of the ground at Bare Hill. One day a small Indian lad found a strange two headed snake beneath a rock ledge. He carried it home with him to keep as a pet. The serpent was carefully fed and eventually grew to an enormous size. He became so large that a supply of food became a grave problem. Finally in his

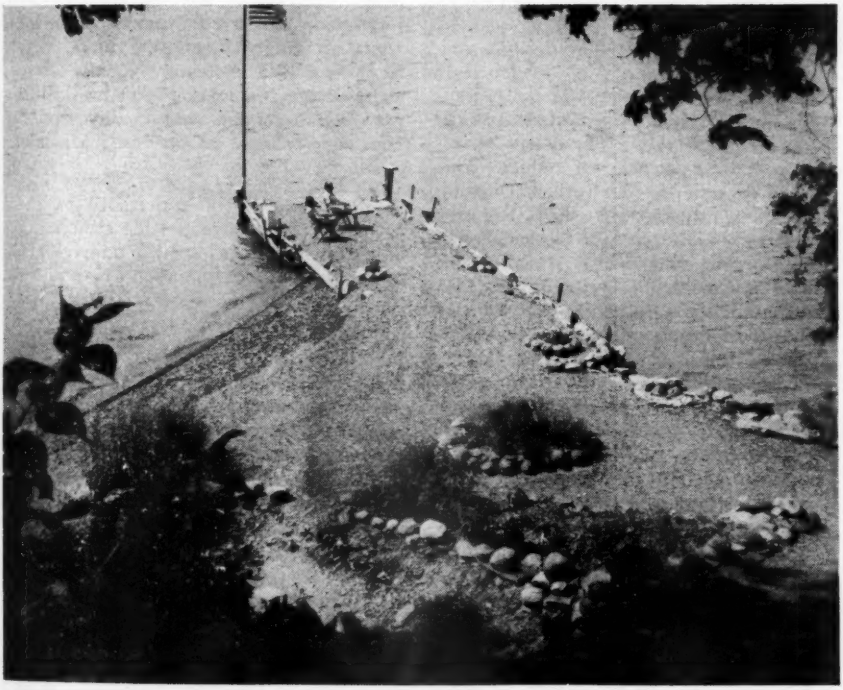


Fig. 3) Sylvania point at the home of Mr. and Mrs. Charles W. Foster. Septaria are used in wall and rock gardens.

hunger, the serpent threw his coils around the hill coralling the entire Seneca tribe and he began to devour young and old.

All of the tribe were soon eaten except for a young warrior and his sister. This young man had a dream in which he was shown that if he would fledge (feather) his arrows with his sister's hair, a charm would prevail. He was warned not to fear the frightful heads or the hissing tongues, but to aim the arrow at the serpent's heart. This he did and the wound was fatal. The serpent rolled and thrashed his way down the hill into the lake disgorging the bones of all of the Senecas that he had eaten. Their skulls are today found as the strange concretions along the shore.

Nowadays, when the wintry winds rush down Bare Hill and whip the waves to whitecaps, local residents say that the serpent is once again turning over on the lake bottom.

WORLD'S SECOND LARGEST SYNTHETIC EMERALD

Washington, D. C., Dec. 23, 1953 — The world's second largest synthetic emerald—weighing 1,014 carats — has recently been added to the Smithsonian Institution's mineralogical collections.

It is a single crystal produced by Carroll Chatham, of Los Angeles, maker of synthetic gems for the jewelry trade. Two years were required to produce this crystal. It was made by a secret process. What was presumably a somewhat similar process, however, was developed in Germany just before the war for production of a synthetic emeraldlike material known as "igmerald". The details of this process, the patents for which were owned by the I. G. Farben chemical trust, were obtained by allied scientific investigators who entered Germany with the American and British armies at the end of the war.

There never has been any pretense that either the German or American products actually were emeralds. Superficially, however, they could not be distinguished from the natural gems and, although much cheaper, may have equal excellence as gem stones.

Actual emeralds, the chief source of which is Columbia, are crystals of the somewhat rare mineral beryl, which recently has become of great commercial importance as the only source of the strategic element beryllium. An extremely minute impurity, due to the element chromium, in such crystals causes the flashing green color. Another equally minute impurity results in the sea-blue gem variety known as aquamarine.

There are some extremely large natural emeralds in collections. The largest known is one of 1,384 carats, owned by the present Duke of Devonshire. In the Vienna collection is an unguent jar carved from a 2,000-carat emerald. An emerald cup, at one time owned by the Mogul emperor Jehan, now in the Gellatly Collection of the Smithsonian Institution, was carved from an emerald crystal weighing about 1,000 carats. Very large emeralds, however, usually have many defects and must be cut by skillful workmen to obtain ring quality stones. The same is true of the artificial material.

However close in appearance to the natural emerald, a man-made crystal can be differentiated easily by a mineralogist by microscopic examination, because it has a different index of refraction, has a different fluorescence when exposed to ultra-violet light, and inclusions of impurities occur in different arrangements.

Genuine emeralds were produced at high temperatures and under great pressure in the depths of the earth in the distant past and result from the crystallization of solution of beryllium, aluminum, and silica. They were brought to the surface in great earth upheavals. Presumably the same process is now going on under the crust of the earth.

Production of synthetic emeralds is much more rapid but requires a duplication of at least some of the conditions under which the genuine stones were formed.

JAPAN NOTES

By COMMANDER JOHN SINKANKAS

EDITOR'S NOTE: This is the third of a series of articles by Commander Sinkankas about his collecting adventures while he is serving aboard a U. S. Carrier as Executive Officer. This ship, a light aircraft carrier, is enroute to the Far East where it will spend considerable time and in doing so, will visit many ports. We hope that you will find pleasure in reading these little episodes out of the life of a regular naval officer who follows the sea professionally but whose off-hours interest is the world of minerals.

The first impression was a favorable one; the bow of our ship was headed toward Tokyo Bay, a thick smog lay over the cuntryside but the magnificent symmetrical cone of Fujiyama rose above the sullied atmosphere until its snow-capped crest was bathed in the pure clean air of higher altitudes. To the south an irregular lumpy mountain puffed forth white and black smoke revealing its identity as a still-active volcano. Gradually we turned north and soon plunged into the industrial haze wreathing the upper part of Tokyo Bay, an inescapable penalty of populous civilization anywhere. Our anchor was dropped in visibility of only several miles but even with this poor view we could see the up-and-down character of the rugged Japanese terraine,—well trodded hills and mountains were everywhere giving truth to the geographer's statement that only 30% of the area is arable.

At the first opportunity I made my way ashore to the railroad station and bought a second class ticket for Tokyo. The train turned out to be clean and comfortable and ran with electric power. It was fairly speedy but the same rough terrain which was noted before required the bed to be extremely tortuous and many tunnels for those places where hills and mountains barred progress. After a delightful trip, I arrived in Tokyo station and calling a cab, went about my business.

The same impenetrable haze which was noted in the bay was if anything even thicker, my cab passed by the Imperial Palace with its water-filled moat but my color camera was left slung over my shoulder never once put to use (during the whole day). After some trials and tribulations stemming from an inadequate address, my taxi arrived at the business firm I was to visit and I had a chance to think about how to spend the remainder of my time. My business hosts were most pleasant and anxious to display their hospitality. "Where would I like to go What would I like to see?" I suggested bookstores, secondhand ones, I had heard Tokyo was famous for them. Fine said one of my hosts, I will take you there.

Soon we were in one of the omnipresent taxis and sped along for about ten blocks into the heart of the Kanda District, an area of Tokyo noted for its thousands of interesting shops, all small but each completely fascinating, selling every imaginable item and a few totally unexpected. Our cab pulled up in a street which as far as I could see was lined with small book shops. The sheer number is staggering, even Fourth Avenue in New York City cannot begin to compare with this booklover's paradise. I explained my wants to my Japanese companion who then made them known as we plunged into one book shop after another. Pickings were slim until we hit one store whose whole rear was completely filled with books on geology, mineralogy, gemmology and allied subjects. Then both of us turned to and carefully looked over everything of interest.

I was naturally looking for books on gems and in due course found a copy of Bauer's famous "Edelsteinkunde" which had originally been in a German school in Tsingtau when that Chinese port was under the control of Germany. Then almost immediately after that, a copy in excellent condition and in the original carton, of Braun's "Mineralreich", a work noted for a large number of excellently-done colored plates on minerals and gems. Even a copy of Pearl's "Practical Gemology" was uncovered here and being less expensive than those I have seen at home, was set aside also. A number of interesting books on gemology and min-

eralogy in Japanese were also acquired, not that I can make heads or tails out of the language but because they did have colored illustrations with English titles. The best of these was a four-volume set of "The Minerals Of Japan" by T. Ito.

Time flew all too quickly as it does in a bookstore and I had to tear myself away upon the gentle and polite insistence of my host who had asked me out to dinner afterwards. We had time for one more visit — to the gem and mineral store of Kinsikishi in the Kanda District and only a few blocks removed from the bookstore area. This small store turned out to be an exceptionally neat establishment with plate glass windows and glassed-in cabinets in which the various wares were displayed. One whole cabinet was devoted to jade jewelry mostly of the Japanese jadeite,—pins, rings, beads, a few carved animals, etc. In the main it was not particularly attractive material and was priced much too high. Native coral was abundant in various jewelry forms and in colors ranging from white to pink to a reddish salmon color. The material took a very good polish, the gloss being so unexpected that one is tempted to believe that a coat of clear lacquer has been applied. This is not the case however, the polish is naturally excellent and would do credit to agate.

Aside from jewelry, the objects which attracted me most were the carvings executed at the Japanese cutting center of Kofu out of all kinds of material. Chief among these are carvings in rock crystal, chalcedony, bloodstone, jasper, etc. The polish is invarably excellent but too often the design is overly complicated and lacking in the subtle grace which the Chinese impart to similar works. The Japanese carver apparently tries desperately to make something which is palatable to Western tastes and in consequence neither pleases the Westerner nor himself. When he is on familiar ground, however, he is unsurpassed.

Another item of interest in Kinsikishi's shop were the quartz pagoda stones which I note are again for sale by several advertisers in our hobby magazines. These interesting objects are little more than triangular prisms of rock crystal engraved with horizontal lines on one of the sharp edges. When viewed from the front the reflection of these notches are tripled and a long narrow pagoda complete with projecting eves is seen. The only trick in their making is to cut the back angle of the prism to about 86 degrees in order to get total reflection. One magnificent prism was noted which stood about 8" high and was priced in the neighborhood of $20.00. Smaller ones of several inches high ran a dollar or two.

Although this same shop sold mineral specimens and slabbing material very little was noted of real interest. The only faceting material was pale blue and colorless topaz crystals from the famous Japanese localities. It is quite likely that suitable material is promptly snapped up for local cutting and carving as soon as it is brought up to the light of day. From all I can gather Japan is decidely deficient in all sorts of artistic raw mineral materials.

Leaving the establishment of Kinsikishi we took another taxi and made our way to an eating house popular with the Japanese but unknown to the Americans who throng the streets of the Ginza District. This was truly a treat because of the opportunity to see an authentic restaurant and eat authentic native food. All of the ceremony was enacted the taking off of shoes, sitting on flat pillows on the matted floor before a low lacquered stand, the girl waitress in native costume, polite, smiling, and indescribably graceful in executing the inherently awkward business of getting up repeatedly from a kneeling position. The food was exotic, tasty, and given in a series of small courses which enable variety of choice and still assure repletion. All in all, it was a most interesting and successful day and it was with considerable reluctance that I returned to Central Station for the train ride back.

The next day found us sailing southward, this time toward Kyushu, the southernmost of the Japanese Home Islands. In due time we anchored in the lovely hidden bay of Sasebo and once again I went ashore to see what this thriving port had to offer.

Sasebo is not to many miles north on the west coast of Kyushu from Nagasaki whose name is well-known both to lovers of Puccini's opera "Madame Butterfly" and to military men as the place where one of the atom bombs was exploded. I have not visited this city at this writing but I have been given to understand that the blighted area is once again covered by a solid mat of houses as it was before that fatal day a number of years ago. But to return to Sasebo.

Sasebo as a city is rather typical of the architecture so prevalent in Japan, a style no doubt severely regimented by the devastating effects of frequent earthquakes. Few houses or buildings exceed several stories in height and the effect of an upper view is one of a rough carpet of dark colored tile roofs, each looking exactly the same as its neighbors. Underneath teems unimaginable life with its noise and carnival atmosphere, Sasebo is no exception. In the shopping district a single long street of several miles in length extends parallel to the waterfront. Countless small shops line both sides with wares spread out onto sidewalks or even upon the roads if space is needed. All is hubbub right up to 11:00 pm when tired owners, convinced that the last Yen has been gotten for the day, pack away their goods and begin putting up the wooden sliding doors which close up their shops.

I soon found an antique shop filled with objects of art both Japanese and Chinese. Modern jewelry such as cultured pearls and Chinese jade were by no means lacking but the word has gotten about that both of these are highly prized by Americans and consequently prices were ridiculously high. Some pearl items cost easily as much as equivalent articles in the States emanating from precisely the same sources of supply in Japan. Oh well, — business is business and the Oriental has never been known to be anything but a shrewd man in the marts.

I turned my attention accordingly to the less known items of art, particularly the stone carvings. A beautifully blue aquamarine belt buckle soon caught my eye. Done in China it consisted of several lanky animals interwined to form the loops of the buckle. A small carving of whitish jadeite of several boys playing with a bird next attracted my view, it had the typical touch of the Chinese craftsman in that several spots of red jade were cleverly used to emphasize the whole composition. A frog at the foot of the urchins for example, had its eyes red while the remainder was white. I found the price of these to be within my means and walked off as proud possessor.

Hidden at the end of a closed-in arcade in the heart of the shopping district I found another antique shop. A beardless young Japanese came out to help me when I stopped, although obviously young he was just as obviously aware of the worth of his small hoard of possessions and nothing in the shop was far below its value. Nevertheless a few items of fair value were purchased after a little preliminary haggling to get the price down. A small and well-colored rose quartz dish and an exceptionally well-executed jade carving were taken. The latter was a beautiful example of the clever utilization of stream-worn nephrite pebbles which were supposed to be particular desired by the Chinese carvers because such material had gone through a sound trouncing in a stream bed and was therefore sure to be exceptionally compact and tough flawless material. In color this piece was nothing to excite one but the artistry was. Each small line, groove, and crevice was carefully excavated and not polished, the tail of the animal (for that is what it was) was grooved with a series of fine scores which were as narrowly spaced as those in a phonograph record. The bottom of the piece was completely finished off and not left flat as is so often the case in less painstaking pieces. Also in this shop were other stone carvings, two jadeite urns with covers, a magnificent lion carved from a grayish-brownish agate beautifully polished top and bottom, an urn of lapis of indifferent quality, another of rock crystal, a hand rest of thin nephrite handsomely mounted in a wooden base, a small cosmetic jar, and many other items. I looked longingly at all of these and wished for the wealth of a Croesus but knew that if I had such wealth these items would not nearly be

so attractive.

In all of these antique shops are to be found a large number of items other than jewelry and stone carvings, in fact lapidary itms are the most rare. Excellent lacquer far superior to the cheap mass-produced tourist grade is still available, still bright and colorful after years of existence. Large carvings in wood of gods, samurai swords, ceramics, textiles and graphic art works are readily available for those who have the price and in their artistic competence rise head and shoulders above the catch-penny stuff being turned out today.

The trip down to Nagasaki was best made by train, accordingly I caught the 0758 train from Sasebo and in a little less than two hours found myself in Nagasaki famous before as a treaty port and as the place where the lovely black-haired Cho-Cho-San waited for her U. S. naval officer to return to her from over the sea in Puccini's famous opera — "Madame Butterfly". They still show her house up on the hill but even this romantic attraction must take a back seat for another not quite so charming — the atom bomb's destruction. Little evidence remains today of the holocaust which once swept this mountain-rimmed seaport town, a keen eye may still see some fantastically bent and twisted girders near the factories about the railroad station but the heart of the city is once again carpeted with the incredible wooden houses lining narrow, teeming streets. An uninitiated stranger would never suspect that the same area was once a desolate plain, and not such a long time ago either.

A brisk walk from the station took me into the heart of the city to the base of several multi-story department stores which along with several other buildings, are made of concrete and steel in the Western style. At their base fluttered the gay flags and bunting which is characteristic of the Japanese shopping district. Side streets could be seen lined completely with restaurants and tea-houses, others specialized in clothing and shoes, while the most important had stores selling everything else. On a quiet side street near the impressive Shinto temple nestling on a flank of a steep hill and overlooking the business district, I found one or two antique shops and even a fairly large secondhand bookstore. Little was found in either concerning, gems, or stone carvings so I continued my search for others more likely to be of interest.

On the main street I paused before several shops which sold nothing but tortoise shell and coral, some very lovely indeed. The shell is obtained from loggerhead turtles which yield the highest quality material in the form of large horny plates on the dorsal region. The material is split into thin sheets and then fabricated by the use of low heat into all sorts of objects both utilitarian and ornamental. Tortoise shell can actually be welded together by the use of heat alone being in this respect, a thermo-plastic. By this method, large and complicated objects can be built up from small pieces, among them noted being: replicas of carp about 12" long, faithfully down to fins and scales; ships with sails and various impedimenta on their decks including a highly polished branch of precious coral placed in an upright position directly in front of the foremast. What its significance is I could not determine from the shop proprietor who neither understood my Japanese nor I his English. In any case it did look well, however unlikely it may be from the practical standpoint of deck seamanship. Other objects were of lesser size and included such items as cigarette cases, small boxes, combs, barrettes, pins, brooches, and infinitum. Possibly the loveliest of the lot (and most expensive) were combs for milady's hair with their upper parts decorated with the exquisite small work that the Japanese are famous for. In this case, the decoration consisted of fantastically minute bits of iridescent abalone shell implanted in either gold or silver plate, causing the comb to flash with the flames of an opal as it was slowly rotated before a light. Each of the inlaid bits of shell did not exceed 1/32" diameter. As for quality of tortoise shell in general, handsomely mottled material of transparent yellow and rich dark brown seemed to be most sought after. In one of these stores I picked up a small branch of precious white coral and one of red to add to my

collection.

Looking further I soon spotted a large antique shop with a considerable number of stone carvings and gems on display. Jade as usual was very much in evidence and as usual the magic green colored pieces demanded magic prices. These I graced with only a casual glance and continued on to others far more interesting. Most prices were quite high even by Japanese standards but I soon found out that the proprietor had to put some kind of price on each piece and lacking any infallible sense in this respect, preferred the errors to fall on the high side. A ridiculously cheap crystal sphere set on a bronze flower and provided with its own carrying case attracted my notice, the price as I recall for this 3" diameter sphere was about three or four dollars with everything thrown in. "Is this crystal?" — I asked, "Certainly" answered the young man showing me around, "The real thing!" A brief examination of the alleged quartz with a 10 x loupe showed it to be generously supplied with spherical gas bubbles. I invited his attention to these indisputable proofs of glass-factory origin and whether his chagrin was real or not. I don't know, but he did show enough of it. Next we passed on to some very indifferent quartz carvings, statuettes and the like, and then on to a case full of cut stones. These also held little interest being mostly agates en cabochon, and citrines, smoky quartzes, and many synthetics along with glasses. A broken stone bracelet attracted my notice because of its lovely pale green color and high degree of translucency. My heart leaped as the thought of "Jadeite—high quality jadeite" passed through my mind and the price,— well that was only 4 dollars. Another disappointment in this one also!—not jade at all but an excellent quality of bowenite serpentine, pale green in tint with a brownish streak, very finely granular and as I said before, almost transparent. Perhaps it wasn't jade but it was definitely unusual so this was put aside for the reckoning later. A small light green jadeite seal from China was also priced modestly and its carving was very well done — a lion seated on top of a rectangular pedestal with the tip of his tail cut so as to show a dark green spot on the very apex. This too was set aside.

A number of 'different' items were for sale also including two quartz crystals each mounted on wooden stands. The first was a single quartz point of about 4" diameter and about 5" high with its pyramidal faces curiously etched, the second—a flattened group of parallel smoky quartz crystals of a dirty brown hue and extremely flawed. In spite of their low mineralogical quality however, they both made effective objects of ornamentation, the geometrical forms of the crystals contrasting subtly with the curved and gnarled surfaces of the wooden stands which were made of stained and polished roots.

Another object of interest was a bowl roughly rectangular in shape, rather deep, and composed of a granular quartzite stained in areas with a vivid red hue. This like most of the other objects was also mounted on a polished root section and again, in beautiful harmony. The underside of the bowl was carved in the conventionalized representation of a mountain scene with waterfall while the inside was perfectly plain. Traces of dirt in various cracks indicated that it had at one time borne a planting of flowers and had possibly graced the 'tokonoma' or alcove in a Japanese house where some special object of art is customarily displayed. It was not difficult to imagine the delight this object gave to whatever eye rested upon it.

Much coral was for sale in Nagasaki as in the other cities of Japan, the residents prizing its quiet colors and soft lustre somewhat more than we. The native carvers are capable of exquisitely detailed work in this material, the fineness and complexity of their carvings being everywhere in evidence. They manage to impart an excellent glossy polish which in some harder specimens seem almost glasslike, this being more true of the bright red kinds than the pinks. Japanese corals come in a range of colors from dead white to pale pink, deep pink, to salmon, to bright red. Some single pieces show mottling of pink or red and white. Large pieces are carved into brooch stones generally in a flower pattern while

smaller pieces are made into carved or uncarved beads. Tiny fragments are polished and pierced and strung into barbaric-appearing necklaces which are commonly for sale even in the United States. Although the latter are rather cheap, larger pieces such as brooches are surprisingly expensive.

After thoroughly tiring myself with walking through many blocks of the shopping district, I found a neat and clean restaurant and rested from the day's exertions. All in all it had been a profitable trip if not from the collecting standpoint then certainly from the educational one. Any of the Japanese towns or cities is so completely alien to what one has become accustomed to in the States that to look is to learn, and, to enjoy. Sayonara!

RADIATION INSTRUMENT THAT DETECTS OIL FIELDS

The model 118 "Royal Scintillator" will define the limits of an oil field and eliminate the need for drilling many dry holes. It will also locate uranium deposits and has many uses in a scientific laboratory. It can be operated from an aircraft or a moving vehicle. The entire instrument is contained in a small case which weighs 24 lbs. It employs a 2¼" diameter Thallium activated Sodium Iodide Crystal as its detecting element and incorporates a scaling circuit as well as a ratemeter. Its ranges are .01, .025, .05, .1, .25 and 1 MR/HR. It has a counting rate of 500,000 counts per minute in one MR/HR field of radiation. For further information, write to Precision Radiation Instruments, Inc., 2235 South La Brea Avenue, Los Angeles 16, California.

ULTRA-VIOLET PRODUCTS ACQUIRES VOGEL LUMINESCENCE CORP.

Ultra-Violet Products, Inc. of South Pasadena, California, has acquired all outstanding stock of the Vogel Luminescence Corporation, of San Francisco, for an undisclosed sum. Announcement was made today, March 29, by Thomas S. Warren, president of Ultra-Violet Products, Inc. and Gustav Knecht, Jr., president of Vogel.

A 22-year old company, Ultra-Violet is the largest manufacturer of black light fixtures in the West, and is nationally known for its Mineralight lamps which are recognized as outstanding in the field of mineral analysis and prospecting. Company also manufactures Blak-Ray and Fluor-O-Chek lamps.

Vogel Luminescence has specialized in the manufacture of luminescent, phosphorescent and fluorescent paints, and the joining of the companies brings together both black light manufacturing and production of the accessory, materials which are widely used today in outdoor advertising, research and industrial inspection and production.

The Black-Light Corporation of Northern California, exclusive sales distributor of Ultra-Violet Products, Inc., will move its offices from Berkeley to those of Vogel Luminescence, at 925 Harrison Street, San Francisco. David Grigsby, president of the Black Light Corporation of Northern California, will head sales and promotion of both companies and represent Ultra-Violet Products in the Bay area.

Gustav Knecht, Jr. of Vogel Luminescence will retire from active participation, but Marcel J. Vogel will continue as research director, Luminescence Division.

In making the announcement of Ultra-Violet Products, Inc. purchase, president Thomas S. Warren declared, "The acquisition of Vogel Luminescence makes Ultra-Violet the only black light manufacturing company in the country which offers to its customers a complete line of long-wave and short-wave ultra violet sources and luminescent accessories."

SINHALITE, A NEW GEM STONE

Washington, D. C., Mar. 2, 1954 — A new gem stone has been found by mineralogists of the British Museum and the Smithsonian Institution. It is a golden-brown, light flashing mineral found in Ceylon. British Museum experts have given it the name "sinhalite."

Actually, according to Dr. George S. Switzer, Smithsonian Mineralogist, this mineral, which is a magnesium-aluminum-boron combination, has been used in the jewelry trade for many years but has been misidentified with the rare semi-precious stone peridot, the "evening emerald" of the gems of Cleopatra. Gem-quality peridot has been used to a limited extent in rings, bracelets, and other personal jewelry, but its most promment use was in religious objects — statues of saints for example—during the Middle Ages. Its sole commercial source was the island of St. John in the Red Sea. It still is mined there.

The new sinhalite and peridot are superficially indistinguishable although of quite different mineralogical composition. So close is the resemblance, in fact, that nobody has questioned the identity until recently. Stones obtained from Ceylon were assumed to be of the same material as those from the Red Sea island; they were sold as such by jewelers, and so labeled in museum collections.

Some months ago, however, a 146-carat stone, supposedly peridot, was submitted to Smithsonian mineralogists for determination of its authenticity. They found that its optical structure was quite different from that assigned to the well-established precious stone. This led to a chemical analysis, which showed that the two gems were only distantly related. They were, however, of equal gem quality.

Supposed peridot specimens from Ceylon were in the British Museum collections. When the Smithsonian finding was called to the attention of the British mineralogists they had no difficulty in confirming it with their own material, and the stones were given official standing as specimens of a new mineral.

That the jewels of Cleopatra were peridots is, of course, based entirely on tradition. It is highly probable, however, that the Red Sea mine was worked in her day—in much the same fashion as it is at present—and that this gem stone would have been one most easily available to her. Although long recognized as gem stones, peridot of true gem quality has been quite rare and has been little used in this country. There probably are not more than a few score peridot rings, valued at about $100 a carat, and the best specimens are in mineralogical collections. It has not occurred to collectors to question the stones obtained from Ceylon, which has been considered as another peridot source.

Peridot has a considerable color range from brown to green, depending on various impurities which may be present. The known specimens of sinhalite are all golden-brown, but this mineral also may occur in several colors. Greenish specimens, approaching emeralds in appearance, probably would have the greatest value.

While peridot is found in several localities—including the Southwest, where pebbles known as Job's-tears are collected —sinhalite is, so far as now known, confined to Ceylon.

Anybody with a supposed peridot ring which turns out to be sinhalite need not feel cheated, say the Smithsonian mineralogists. The mistake was perfectly honest, and the owner may have something of greater value than originally supposed.

Elementary Faceting Instructions

It's new — just off the press—1954 copyright.

Author is E. J. Soukup, graduate gemologist and Director of the San Diego Lapidary Society faceting school.

The book takes the beginner step by step from start to finish on how to do the standard brilliant cut and illustrates the how of error and correction.

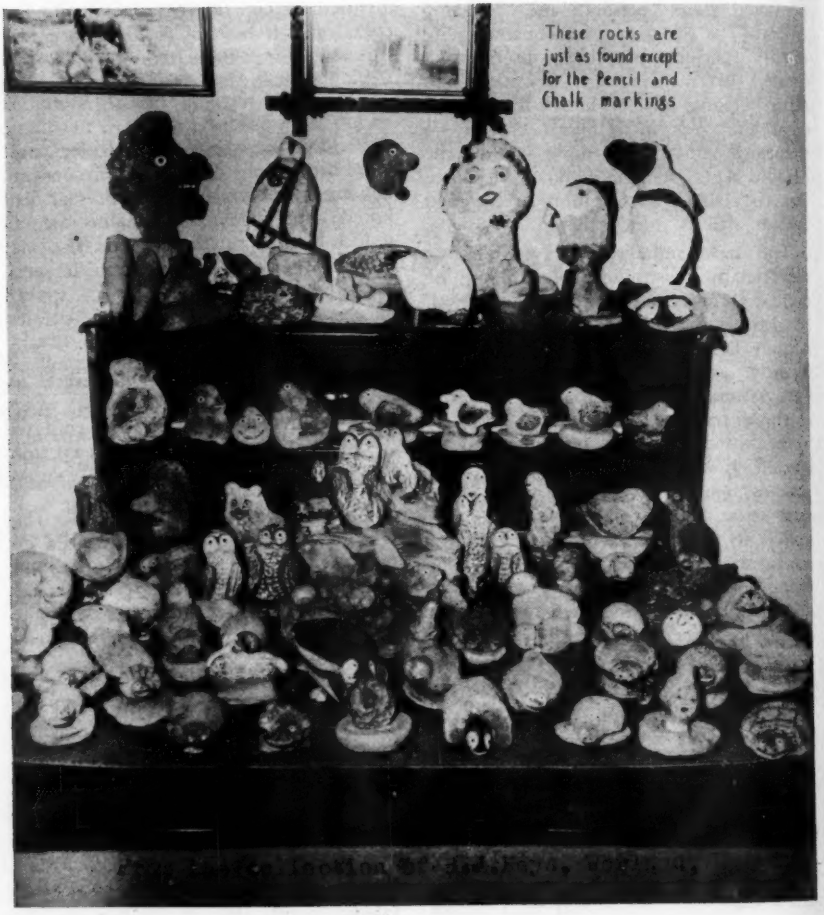
Price $2.50. Published by the San Diego Lapidary Society, Inc., P. O. Box 801, San Diego 12, Calif.

ROCK - ANIMAL COLLECTION

Something new in collections was brought recently to our attention when the following letter, dated Nov. 26, 1953, arrived from B. J. Keys, Box 572, Worland, Wyo.

"I am enclosing two pictures of my rock-animal collection which I thought you might like to see and possibly use in R & M sometime. Not a one of those rocks has been changed in anyway except for the pencil and chalk markings.

"This collection took the Blue Ribbon in the special exhibits at Caldwell, Idaho, in the 1952 Northwestern Gem and Mineral Show and I was asked to bring it to the Portland and Long Beach shows this year but could not. I am sending the two pictures because the smaller one shows more plainly how they look but contains only a few of them. On the back of the larger one I have made some notes about them.



"They are not for sale as they cannot be replaced and there are no two of the same animals except the owls.

"This is just a hobby with me. I have lived in Wyoming over 62 years and am 79 years old."

The notes on the back of the larger picture reads:—

"These are sand concretions and are just as found except for the pencil and chalk markings for the eyes, etc. At the upper left are the remains of probably the first Wyoming sheep camp. The sheep herder with horse and dog between. The contents of his grub box consists of two petrified sweet potatoes, turnip, carrot (note core in carrot), loaf of peanut bread (actually looks like made of peanuts), dish with petrified peanuts which prove the peanut bread and at right of horse, dish with all that remained of the sheep. The sheep, next, was not found with this camp.

I have recently added 25 new figures to this collection making 100 or more all different and no two alike except the owls.

"A magnifying glass will show the smaller animals more plainly.

"I was requested to bring this exhibit to the Portland, Ore., and Long Beach, Calif., shows this year but was unable to do so. It was shown at the Wyoming Gem & Mineral Show at Cheyenne in June and has been shown at the state and county fairs."

Wealth of knowledge among ads!

Editor R & M:

Best wishes and I must tell you that I certainly enjoy everyone of your magazines. The cover is excellent, the stories interesting and a wealth of knowledge is found throughout the ads. I believe the latter has helped considerably as this information has given me a sense of value (as to material worth) of my own collection. Course this is in addition to numerous other reasons and senses of appreciation that we regard our collections with.

Bob Markert
107 W. Ridge St.
Ishpeming, Mich.

Feb. 225, 1954

Minerals Unlimited Expands

Minerals Unlimited, 1724 University Ave., Berkeley 4, Calif., have doubled their store size by taking in the store next door to their old location. The following letter dated March 3, 1954, and signed by Scott J. Williams, one of the owners, reads:

"You may be interested in printing some news of our new expansion. We have doubled our space and can now accommodate twice as much in the way of both mineral and lapidary stock. Our showrooms have been expanded and our shipping space has increased tremendously, so that future service to our clientele will be much improved.

"We are also putting in a 'Stamp Corner' for philatelists."

World News on Mineral Occurrences

Items on new finds are desired. Please send them in.

Abbreviations: xl—crystal xled—crystallized xline—crystalline

ALABAMA—W. M. Johnson, RFD 6, Knoxville, Tenn., has sent in the following item on Alabama:

"Arsenopyrite has been mined in adjacent parts of Randolph and Clay counties near Cragford. There the sulphide veins cut thru slate and phyllite. The veins are reported to carry arsenopyrite, galena, sphalerite and chalcopyrite with quartz, feldspar, limonite, siderite, muscovite, biotite and possibly epidote and topaz as accessory minerals."

ARIZONA—We recently received a vialful of small deep red, transparent gemmy pyrope (garnet) pebbles from David P. Record, Mission Curio Mart, 4400 Mission Road, Route 3, Box 384, Tucson, Ariz. A letter, dated Feb. 28, 1954, from Mr. Record, reads as follows:

"We are enclosing a vial of pyrope garnets located in a granite mica schist in Sabino Canyon, north of Tucson (Pima Co.), Arizona. These garnets are found about one mile above the end of the road. Garnets can be recovered by panning in the creek but are mostly of small size. To recover the large ones one has to break them out.

"Enclosed also vial of garnet sand, same locality (see The Sand Collector in this issue)."

ARKANSAS—The Morning Star mine, in Marion County, Ark., has furnished many handsome specimens of greenockite as bright yellow coatings on smithsonite. Desiring to ascertain the location of this mine we petitioned the help of Byron C. Marshall, 204 Central Ave., Hot Springs National Park, Ark. Here is his reply, dated March 5, 1954.

"The Morning Star Mine is near the little village of Rush, on Rush Creek, in Marion county. This village of Rush, is about 8 miles south (S.S.E. to be exact) of Yellville, on a bee-line, and a few miles farther by road. Yellville is the county seat and is situated in about the center of the county. I do not know if this mine is still in operation, as I haven't any recent report on same. Greenockite, "turkey fat", was on display at our recent local mineral show, as several nice specimens, by one of the dealers; however I did not ask from what mine these were from."

CALIFORNIA—Ronald L. Ives, 5415 Main St., Williamsville 21, N. Y., has sent in a clipping from the NEW YORK TIMES, dated Feb. 14, 1954. The first paragraph reads:

"The Salton Sea (in southern California —chiefly in Imperial County) one of the World's great geological freaks of nature, is slowly but inexorably making a lot of maps and travel guides obsolete. A landlocked body of water slightly saltier than the ocean, about forty miles long and twelve miles wide, it is gradually getting deeper, flooding out settlements and some of the natural wonders and points of interest along its shores."

Mr. Ives' letter, dated Feb. 18, 1954, reads:

"The accompanying clipping from the Sunday's NEW YORK TIMES may be of interest to you, as it describes the inundation of the Imperial Valley Mud Pots. It seems that my photos of them, taken about four years ago, may be a final record, instead of just a routine checkup.

"However, these mud pots were submerged about forty-five years ago, when the Colorado River broke through the head-gates of the irrigation systems, and the mud pots regenerated as soon as the lake waters evaporated away, so they may regenerate again in a decade or so. It

will be interesting to see what happens."

See "Mud Volcanoes of the Salton Depression," by Ronald L. Ives, Rocks and Minerals, May-June, 1951, pp. 227-235, 4 illus., 1 map.

"I am sending you some samples of pyrite in light colored schist. These samples come from the north side of the gold mine pit at Carson Hill, Calaveras Co., Calif. The pyrites nearest the surfaces are tarnished with limonite from contact with moisture and air."—letter dated Oct. 19, 1953, from Carl R. Englund, 740 Valencia Mesa Dr., Fullerton, Calif.

In the lot were 12 loose ½ inch pyritohedrons having a dark brownish color—very nice xls. One light colored schist had 3 of the dark brown pyritohedrons embedded in it. Another light colored schist showed 10 lustrous, brassy-yellow pyritohedrons (2 largest are ½") embedded in it.

The following letter, dated Feb. 4, 1954, comes from Gordon ViGario, 2231 Pine St., Bakersfield, Calif.

"A few days ago, I visited the Pacific Coast Borax Mine, at Boron (Kern Co.), Calif. While there, I obtained some of the various borate minerals that are mined for commercial purposes. Please find inclosed the following minerals: Kernite, altering to Tincalconite, and Satin-spar Ulexite; both from Boron.

"The following is a list of the minerals that were given to me through the courtesy of the foreman:

"Ulexite-satin spar type; and "clam shell type." The clam shell type is very unusual in the fact that fibrous xls arrange themselves in a radiating fashion from a central point. This gives the effect of a clam shell.

"Kernite — long white to clear cleavages. This type reminded me of white Spodumene.

Tincalconite—as a thin white film in Kernite. This mineral is the intermediate type between Borax and Kernite. Borax has 10 molecules of water, per molecule of Borax; Tincalconite has 5; and Kernite has 4.

"Colemanite—as xline, white, massive material. This mineral is rather rare for Boron.

"Ulexite pseudo after Borax. This occurs as fairly large reddish-white monoclinic xls. The foreman said that these xls were quite hard to come by. One has to go several hundred feet down and dig them out by hand. Too, he said that they rarely found a pocket of them, and that they were quite lucky if they found complete xls.

"During Easter vacation, I plan to go to Searles Lake, at Trona, Calif. to do extensive collecting. I hope to be able to send you a nearly complete collection of the rare minerals that occur there."

COLORADO—A handsome specimen of xled rhodochrosite on a base of fine xline pyrite and coming from the Brooklyn mine in San Juan County, Colo., has been donated to R & M by the Southern Gem & Mineral Co., 2307 N. Mesa, El Paso, Texas.

"We consider this mineral rather interesting because of the fine crystallization and rather bright pink color to be found in most of this rhodochrosite."—letter dated Dec. 24, 1953, from M. B. Barron, Secretary-Treasurer of the Southern Gem & Mineral Co.

CONNECTICUT — Fine crystallizations of bornite were once found at the old abandoned copper mine near Bristol, Hartford Co., Conn. The mineral is brownish-bronze on a fresh surface but tarnishes to a purplish tint on exposure to the atmosphere.

DELAWARE — Fossil shark's teeth have been found in soft marl that was dug out of a dredged canal at Summit Bridge, New Castle Co., Del., so we have been informed by Leonard A. Morgan, 217 So. Atlantic Ave., Haddonfield, N. J.

FLORIDA—"Flash! Hold everything—special from Florida! Was planning to write you when we got home but this is too good to keep. At least we think so. Yesterday my husband and I discovered a spot a few miles south of Ocala, Marion Co., Fla., on Hwy. 301, which produced a whopping big geode, embedded

in a huge lime rock boulder. Evidence of someone before us having removed the tip of several smaller ones. It took a lot of hard work at the end of a pick and nearly four hours to get it out. It measures 18 inches long as we found it (someone else had broken both ends off), 7 inches wide and 9 inches high. It is lined with good sized clear xls throughout. Some have slender crystals 1/8 inch long standing up which are beautiful but hard to describe. The broken ends (small) allowed dirt to get in so it needs cleaning.

"Do you know of anything to equal it, coming out of Florida? Florida has so far proved to be thrilling to a couple of rockhounds. More later."—letter dated March 18, 1954, from Mrs. John Roder, Toccoa Falls Inst., Toccoa Falls, Ga. (but sent from Ocala, Fla.).

GEORGIA—Dark gray platy masses of barite coated with colorless hyalite opal come from Emerson, Barstow, Co., Ga.

IDAHO—A most interesting specimen has been received from Clarence Martin, R 3, Blackfoot, Idaho. It consists of deep blue platy xls of selinite (gypsum) on grayish-black chlorite schist and comes from the Bay Horse district, Challis, Custer Co., Idaho.

This is not only the first blue selenite we ever saw but the specimen had us fooled at first as some of the xls are beautiful colored, transparent, and resemble in appearance gem quality kyanite. However the crystal form, hardness, etc. soon identified it as selenite.

ILLINOIS—The following letter, dated March 4, 1954, comes from Joseph A. Schraut, Jr., 4125 Fillmore St., St. Louis 16, Mo.

"Under separate cover I am sending you an unusual fluorite specimen. It is yellow fluorite xls either etched or distorted into curved tetrahedrons. On this fluorite are sphalerite xls with purple fluorite xls. On the curved seemingly etched fluorite is marcasite giving a peculiar burnt odor—the whole specimen has this odor. The small purple xls appear to be etched but I have seen specimens that were not etched but typical sharp clear xls.

"The area of occurrence is only one small spot about 50 feet wide, 100 feet long, and only about 8 feet high, about 250 feet down in the newly opened North Green Mine, Cave-in-Rock, Illinois. This is the only occurrence in the Rosiclare District, however, Dana reports such occurrences from the New Mexico and the English deposits.

"Along this small volume of occurrence are gigantic xls of sphalerite, some 3 to 4 inches across, of the type on the yellow fluorite. Also on the fluorite are tabular plates of optically clear calcite about 1/16" long and 1/16" thick.

"Some of the sphalerite has this seemingly etched look to it also. Perhaps the occurrence was caused by the flow over the yellow previously deposited fluorite of a fluorite soluble solution causing solution of the yellow fluorite and deposition of the purple fluorite and the marcasite.

"Anyhow, I hope you enjoy the specimens as they are causing a lot of talk here."

This intensely interesting specimen, weighing 2½ lbs., comes from the famous fluorite mines in Cave-in-Rock, Hardin Co., Ill. The large black sphalerite xls (with small purple fluorite xls sprinkled over it) and embedded in a mass of yellow fluorite xls, makes an attractive specimen. Under a long wave light, the yellow fluorite fluoresces greenish.

INDIANA—"If you will refer to R & M for Sept.-Oct. 1952 on page 488, you will note I sent you two limonite specimens from Plummer's Hill (Putnam Co., Ind., 7 miles west of Greencastle).

"The N.Y.C.R.R. has a deep cut thru this hill and from it I am sending you a few specimens.

"A clipping in our local paper recently taken from a county paper published in 1880 predicts that Greencastle will become the center of a great iron manufacturing industry because of abundance of ore nearby."—letter dated Sept. 24, 1953, from Walter Reeves, R. 3, Greencastle, Ind.

A number of specimens from Plum-

mer's Hill were also received. Three were limonites, brown to black in color (one was dark brown on banded gray sandstone, another was a brownish limonite concretion, the 3rd an impure limonite containing pyrite and coated by red hematite).

IOWA — The following note, dated April 5, 1954, comes from Amel Priest, Peru, Iowa.

"I'm enclosing a xl group found on the dumps of another limestone quarry, this one south of Pella (Marion Co.), Iowa. Found several clusters of them."

A colorless group of selenite xls, about 1 x 1 inch in size, was received. A nice specimen.

KANSAS — Gray xline masses of anhydrite are found in the ceiling of the natural bridge, located 6 miles south of Sun City, Barber Co., Kans.

KENTUCKY—Some few months ago we received the following item from Bob Barnes, 3930 Brookfield Ave., Louisville 7, Ky.

"Nice yellow to tan fluorite xls have been found in the Lockport quarry, Lockport (Henry Co.), Ky."

LOUISIANA—Mark W. Mitchell, Box 1000, Lafayette, La., has sent in a small specimen of reddish halite which comes from the salt mines on Jefferson Islands on the boundary line of Vermilion and Iberia Parishes, about 9 miles west of New Iberia, La. The specimen has small cavities lined with tiny red halite xls.

MAINE—Dark gray xline masses of labradorite have been found in Union Knox, Co., Me.

MARYLAND — The following note, dated Feb. 23, 1954, comes from Robert Gerstmyer, 19 Evans Ave., Timonium, Md.

"The well known Campbell's limestone quarry at Texas, Baltimore Co., Md., has produced very good crystals of all types. Once in a while there have been found wernerite crystals but not very good ones during the past few years. On Feb. 13, 1954 Robert Gerstmyer, a member of the Baltimore Mineral Society, was collecting on some of the quarry's stock piles when he ran across a very nice specimen which he thought contained tourmalines. Later he found out that they were black wernerite crystals of good quality. The biggest one was about 1¼" long and ½ wide. They fluoresce a beautiful yellow under the long wave lamp."

Some 500,000 cubic yards of rock have been dug out of Raven Rock Mountain, Frederick Co., Md., by Army contractors for making an underground atom bomb-proof command post. Has any reader of R & M examined the rock piles for possible minerals? Might be well worth a visit.

MASSACHUSETTS — Lustrous black platy allanite xls in pegmatite occur in a trap rock quarry at Winchester, Middlesex Co., Mass.

MICHIGAN—Some few months ago we received an epidote specimen from John Argeropoulos, 216 E. Arch St., Marquette, Mich. His letter, dated Aug. 7, 1953, got mislaid, and this is why it was not printed sooner.

"I am sending you a sample of epidote crystals which I discovered about 5 days ago.

"Our family and I were picking blueberries on Sugar Loaf Mountain, about 3 miles north of Marquette (in Marquette Co.), on County road 550, but needless to say after I discovered the epidote I came home with more specimens than berries.

"There's quite an abundant supply, if collectors are interested."

The specimen consists of tiny green epidote xls in a green xline epidote vein cutting a fine xline pinkish feldspar.

MINNESOTA—R. W. Nutting, Forrest Drive, Pekin, Ill., has sent in the following item, dated Nov. 27, 1953.

"Along the northern shore of Lake Superior are two localities, Two Harbors and Beaver Bay (both in Lake Co., Minn.) where the "Mrs." and I were successful in finding small but good

colors in agate. They are found in the gravels on the beach. At Beaver Bay we spent two full days digging in these gravels as two kids might dig in a sandbox. Though the agates were small, they were mostly flawless and make good material for "free-form" cutting and finishing.

"We were successful also in finding some thomsonite at Beaver Bay."

MISSISSIPPI—Brown iron ore (limonite) occurs in green marl near Enterprise, Clarke Co., Miss.

MISSOURI—A letter, dated Jan. 20, 1954, comes from Joe R. Wormington, Route 2, Pierce City, Mo.

"Under separate cover I'm sending you a couple of quartz xl specimens from near Boulder City, Mo. I think this general area has already been described in R & M in an article by the late Mr. T. A. Patterson of Granby, Mo., so I don't suppose I can claim credit for a new xl locality. I believe it was stated that xls up to ¼" in diameter could be found at this locality which is mostly true of the surface finds, but a little hard work in the right places will yield slabs covered with xls that are near one inch in diameter, however most of the xls vary from ⅜" up to ¾". The best specimens occur on the underneath sides of a thick layer of much fractured chert that rests on a foot thick layer of clay. This clay, which I believe to result from the decomposition of a thick layer of dolomite, is literally packed with loose quartz xls and quite frequently in groups up to 3" x 4".

"Boulder City is located in southwestern Missouri, in the south central part of Newton Co."

Two specimens were received. One 4" x 6" in size, consisted of flat lying quartz xls beautifully xled on gray quartz. About half of the xls were slightly smoky; the other half were brownish.

The other, a little smaller specimen, consisted of a group of beautiful lustrous smoky quartz xls.

MONTANA—Brownish rhombohedral calcite xls lining cavities of baculites (fossil) have been found in the Bearpaw shale at Ismay, Custer Co., Mont.

NEBRASKA—Quartz concretions, gray in color, have been found at Pine Ridge, Dawes Co., Nebr.

NEVADA—In the Jan.-Feb. 1954 R & M, appeared an item on p. 24, by C. J. Appling, 2106 Ferger Ave., Fresno 4, Calif., relative to a most elaborate private museum at Tuscarora, Nev. In his letter, dated March 23, 1954, Mr. Appling writes:

"I have just been informed that the museum at Tuscarora, Nevada, has been leased by the Commercial Hotel in Elko, Nevada, and is to be moved there. It belongs to Mr. Phillips and his son gave the above information to my daughter who lives in Elko. I would hate for anyone to go to Tuscarora on the strength of the write-up in R & M only to find the museum had been moved. It would be a 200 mile trip. On the other hand as soon as the museum is located in Elko it will be easily available to anyone traveling Highway 40."

NEW HAMPSHIRE — Brownish xled ankerite with small rock xls have been found in a cavity of iron-stained quartz at the old Dodge gold mine, Lyman, Grafton Co., N. H.

NEW JERSEY — "For the dept. of World News On Mineral Occurrences I'm sending you a package which contains a few pieces of vivianite replacing fossils and a fossil in the typical greensand of Monmouth Co., N. J. The location of the deposit which we visited on Feb. 14th is about two miles west of Middletown, and is torn up and dumped along the route of the new Garden State Parkway. There are plenty of specimens of the vivianite and quite a number of fossils to be found in almost any part of the dumped material."—letter dated Feb. 20, 1954, from W. H. Hayes, 35-22nd St., Irvington 11, N. J.

The vivianite occurs as bluish masses in

dark green glauconite, replacing fossil shells.

NEW MEXICO—About 16 miles east of Lake Arthur, Chaves Co., N. Mex., loose, reddish-brown aragonite xls may be found that are an inch across.

NEW YORK — Last summer (1953) Mrs. Charles Litts, 21 Park St., East Stroudsburg, Penn., did some collecting in St. Lawrence County, New York. At an abandoned talc mine near Gouverneur she found some crystal groups of brownish, gemmy peristerite (a variety of albite showing bluish opalescence); foliated masses of purple hexagonite (a variety of amphibole); foliated masses of dark bronzy phlogopite; and pebbles of dark gray flint. (See note below on the flint). Samples of all of these were sent R & M and they were very nice specimens.

"These specimens all came from an abandoned talc mine (name unknown) near Gouverneur, N. Y. The flint pebbles were plentifull on the talc dump; they are not native stones, I believe they were used to crush the talc.

"The crystal masses (peristerite) were scarce as I could find only a few specimens. These were also from the talc dump."—letter dated July 27, 1953, from Mrs. Litts.

The flint pebbles resemble those imported from Europe and may have come from Denmark or France.

NORTH CAROLINA—An assortment of North Carolina minerals has been received from Col. O. M. Hewitt, 6 E. Forest Rd., Biltmore Forest, Asheville, N. C. Among them was an interesting suite of specimens from the noted McKinney feldspar mine, near Little Switzerland, Mitchell Co., N. C. These specimens were massive green beryl, massive black columbite and massive black lustrous samarskite.

NORTH DAKOTA — Limestone has been quarried along the Tongue River in Pembina Co., in N. E. North Dakota. If any reader has visited the locality will he please send us some notes on what he found?

OHIO — The following letter, dated April 6, 1954, comes from C. O. Gettings, 2001 Starr Ave., Toledo 5, Ohio.

"A large quarry has been started near Sandusky (Erie Co.), Ohio. The original investment of one million dollars by the Sandusky Limestone Co. is starting to show. The actual digging has started and heavy equipment is being moved in. We were there 2 weeks ago but the mud road leading off the main road scared us out. Due to several days rain it looked impassible.

"At Johnstone's quarry north of Trilby, Ohio, we found calcite, both amber and clear, fluorite in small brown cubes, sphalerite in massive calcite and a trace of crystallized dolomite. The fluorescence of calcite is remarkable. The amber fluoresced a pink while the white fluoresced cream. As the two colors are found mixed the contrasting colors under the light are beautiful.

"At a Woodville quarry (Sandusky Co.) we found large celestite xls doubly terminated and an opaque white. They were 3 x 1 x ½. The unusual feature was their light weight. Close examination proved them to be hollow. The walls less 1/16" and the inside coated with thousands of perfect micro celestite xls of the chisel point type. I could think of only one thing. A celestite pseudomorph after celestite. Evidently the original xl was etched or dissolved to a point that only the thin shell was left then built up by a later flow of celestite-bearing ground water. Several fluorite cubes over 2" and of a dark muddy brown color were found in an ancient fracture cavity. Usually the crystallization occurs in fossil cavities."

OKLAHOMA—In the Wichita Mts. (Greer Co.), Okla. amphibole (hornblende) in dark green masses occurs in pegmatite.

OREGON — Near Kerby (Josephine Co.), Oreg., black josephinite nuggets have been found along the Josephine Creek.

PENNSYLVANIA — The following note was received a few months ago from

Robert L. Cox, 228 Elk Creek Ave., Girard, Pa.

"Local collecting areas. Lake Erie beach (peninsula at Erie and Community Park on Rt. 5 just west of No. Girard—in Erie Co., Penn.).

"Water worn pebbles of many minerals such as white quartz, jasper, etc. Some will polish. Occasional deposits of black sand.

"Elk Creek bed, south of Girard. Can't give specific directions but will gladly guide anyone to locality.

"Come-in-cones, fossils (brachiopods).

"Many other creek beds in county yield fossils—spirifers mostly."

RHODE ISLAND—D. S. Wrathall, 47 Common St., Providence 8, R. I., recently sent in a clipping stating that a new tunnel four-fifths of a mile long and four feet in diameter is soon to be driven in northern Rhode Island as part of a new sewerage system. "It's part of the preliminary work for the longest tunnel in the Blackstone Valley Sewer District system which will carry Moshassuck River sewage through the ridge, at some place 150 feet under the surface, to the big Bucklin Point disposal plant in East Providence. It will run from a point approximately at the intersection of Pleasant and Cleveland Streets to Moshassuck St., just west of Main St., and only 1,200 feet from the Providence-Pawtucket line."—states the item.

As the tunnel will go through limestone some interesting minerals may be dug up. Collectors in the area should give this tunnel their special attention and if anything interesting is found please contact R & M.

SOUTH CAROLINA — A very fine coarse xline lustrous brown siderite has been received from Col. O. M. Hewitt, 6 E. Forest Road, Biltmore Forest, Asheville, N. C. The locality for the specimen is the Morgan Mine, 3 miles S. W. of Gaffney, Cherokee Co., S. C.

SOUTH DAKOTA — Some few months ago John P. Connor, Box 522, Armour, S. D., sent us an interesting specimen which he had found near Lake Andes, Charles Mix Co., S. D. The specimen was a dark green (almost black) coarsely xline augite (pyroxene).

TENNESSEE — William M. Johnson, RFD 6, Knoxville, Tenn., has sent in a long clipping taken from the Knoxville Journal of Sun. Feb. 14, 1954. The clipping has reference to a big maganese operation that is taking shape in mineral-rich Johnson County, Tenn., near Mountain City.

TEXAS—Tiny black lustrous flakes of hematite with smoky quartz in cavities of red rhyolite, have been received from W. T. O'Gara, 2231 Hurley Ave., Fort Worth 4, Texas.

The specimen, a pebble was found in the Millican Hills, about 51/2 miles north of Allamoor, Hudspeth Co., Texas.

UTAH—A new deposit of saponite has been found about 7 miles southwest of Milford, Beaver Co., Utah, in the Star Mining District. The deposit was found in a small adit located near the Commonwealth mine. The area was actively mined for lead, silver, and copper in the 1870's and again around 1909.

The saponite, located in the Topache limestone, is found in a poorly defined vertical fissure of about 3 feet in width. In a hand specimen the clay mineral (saponite) is snow-white and porcelain-like in appearance, but is soft and has a greasy "feel". Associated with it is considerable siliceous material believed to be chalcedony. The deposit has been described by Harold P. Cahoon, "Saponite never Milford, Utah," March-April 1954, AMERICAN MINERALOGIST, pp. 222-230 (Walter F. Hunt, Editor, University of Michigan, Ann Arbor, Mich).

VERMONT — The following letter, dated April 20, 1954, comes from Wm. H. Robbins, RRI, Hampton, Conn.—

"I have just finished reading my first copy of ROCKS AND MINERALS and found it very interesting. Read your 1954 resolutions and am going to start now.

"I am not a collector of long experience, about 11/2 years, to be exact, but do like it. I have nobody to share my finds

with so am only too happy to send some to you. To you they maybe the run of the mill, but to me they are something that I have not seen before. No. 1, No. 2, No. 3 were all found in the North Branch Brook at Bridgewater (Windsor Co.), Vermont."

No.1—is a very fine compact-fibrous mass of actinolite (amphibole).

No. 2—is a ¼ section of a bluish-gray talc pebble which in its entirety must have been 3 inches in diameter. Thin veins of brown calcite penetrate the talc. This is the first talc pebble we ever saw.

No 3—is a flat water-worn lustrous gray phyllite showing numerous squarish masses of dark brown limonite after pyrite cubes.

VIRGINIA—On April 2, 1954, the Editor of R & M, with his cousin Emily Karolack, was in Arlington (Arlington Co.), Va., visiting at the new home of their cousin, Mrs. Myrtle Phillips (4606-27th St.). Myrtle lives in a new development known as Forest Hills of North Arlington.

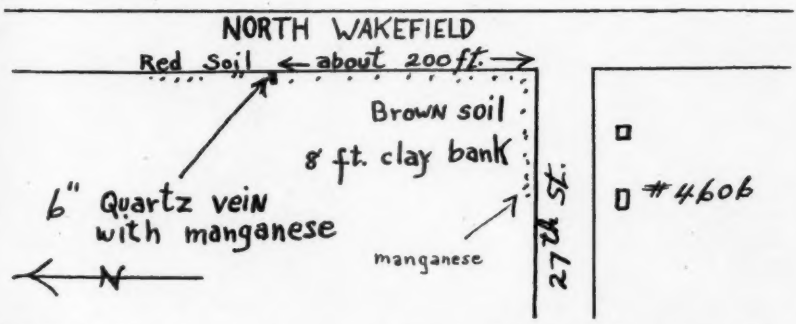
Directly across from Myrtle's home was an 8 foot clay and sand bank with remnants of a smoky quartz vein. Masses of the quartz were scattered all around. This quartz showed numerous deep black patches of manganese (earthy wad and botryoidal crusts of psilomelane). Around the corner, on North Wakefield, a distinct smoky quartz vein (6" thick) was found cutting the clay and also coated with manganese (wad and botryoidal psilomelane). Thin grayish crusts of hyalite opal coated some of the psilomelane. There was so much manganese present at both sites, that the Editor wanted the girls to see it and he went back for them. They were intensely interested to hear that manganese was present so close to the house and of course went out to see it. With the girls (Emily, Myrtle, and Myrtle's youngest sister, Marjorie) the site was carefully examined and though we went completely around the block, only the two occurrences noted above could be seen.

WASHINGTON — Tiny but lustrous pyrite cubes in dark gray compact limestone and found in Loomis, Okanogan Co., Wash., was received from Walter W. West, Loomis, Wash.

WEST VIRGINIA — Grayish pebbles of chert have been found near Triadephia, Ohio Co., W. Va.

WISCONSIN—A very nice polished maroon catlinite and coming from Rice Lake, Barron Co., Wisc., was sent us by J. A. Helland, 1115 Soo Boulevard, Rice Lake, Wisc. His letter, dated Jan. 18, 1954, reads:

"I am mailing you under separate cover a small sample of catlinite. It is found in an old Indian quarry, which even in our community is very little known, and is far from any trail or road. It is still pretty much as it was when the Indians left it."



Map showing location of manganese occurrence in the Forest Hills section of North Arlington, Va.

WYOMING—A letter has been received from Ruel B. Triplett, McKinnon, Wyo., part of which reads:—

"Enclosed are some pictures which show some record-breaking concretions. They are sort of sandstone formation, but don't contain anything, their size being their attractive feature. They are located 8 miles S.W. of Rawlins (Carbon Co.), Wyoming, in an isolated area. Most of the smaller ones have been hauled away for lawn ornaments. These pictures were taken in 1945."

A later letter from Mr. Triplett gives more information.

"One day in the Spring of 1945 in company with Louis Cassinat of Rawlins (Carbon Co.), Wyo., our friend & guide, myself, son John and daughter Marie went to a formation of huge concretions. It was 7 or 8 miles southwesterly from Rawlins over a winding road and stock trail. The country was slightly hilly and no prominent land marks so it was necessary to have a guide. On just one particular hill were the concretions. To say they were large is an understatement as some were about 6 ft. in diameter. One might think their large size would accompany an unusual mineral formation inside but such is not the case as they are entirely solid and the only nucleus, I was told is sometimes a fossil leaf, however I didn't verify this. Their only point of interest is their size which is also their salvation, since most of the smaller ones have been carried away and used for lawn ornaments and as such they are far less impressive than when found as nature placed them. It was blowing a gale that day. Marie got a piece of gravel in her eye and I lost my hat."

AUSTRIA—A new mineral, given the name gorgeyite, has been found in the salt deposit at Isch, Upper Austria Province, Austria. The mineral, occurring with glauberite, halite and polyhalite, is in thin tabular xls, colorless to yellowish, and is a potassium calcium sulphate. The name is for R. Gorgey, who published many papers on the petrography of Austrian salt deposits. AMERICAN MINERALOGIST, March-April 1954 p. 403 (Walter F. Hunt, Editor, University of Michigan, Ann Arbor, Mich.).

BURMA — The following item was clipped from the Sat. Dec. 12, 1953, issue of the CATHOLIC NEWS (of New York City):—

Mogok, Burma — Thousands of Burmans are flocking into his parish from

The huge concretions near Rawlins, Wyo. Marie and John Triplett look small in comparison.

the inaccessible surrounding jungle, reports Columban Father Edmund McGovern, but "not just to be near the church," the largest sapphire in the world was discovered in his parish recently.

When cut, the stone will weigh 30,000 carats. Since it is a flawless sapphire, a type much admired by Americans, it is expected to fetch $600,000 in the U. S. It is beyond the purchasing power of any Burman.

"Thanks to this find, it will be possible to reach many more people now," commented the Columban.

Marie Triplett hiding behind a concretion or is she trying to lift it?

CANADA—Small masses of lead-gray molybdenite in silvery greenish sericite schist and coming from the La Coone District near Amos, Que., Canada, have been donated by John W. Edwards, 305 Avenue Road, Toronto 5, Canada.

CHILE—Green epidote pebbles, also reddish rhyolite pebbles containing green epidote and white calcite, have been donated by W. T. O'Gara, 2231 Hurley Ave., Fort Worth 4, Texas. Mr. O'Gara had collected the pebbles 12 miles south of harbor of Tocopilla, Antafogosta Province, Chile. Some of the rhyolite pebbles had bluish incrustations of chrysocolla and greenish incrustations of malachite.

ENGLAND—A few small xls of colorless veatchite have been found in well cuttings from the D'Arcy Exploration Company's borings at Aislaby, Yorkshire, England, according to notice No. 84 of the Mineralogical Society of Great Britain released Jan. 24, 1954 (G. P. Claringbull, Gen. Sec., % Geological Society, Burlington House, London W.I., England).

GERMANY—Some few months ago, we received the following letter from Werner Lieber, Hubschstr, 24, Karlsruhe, U. S. Zone, Germany.

"In a few days I will send you some minerals including several found in the Kaiserstuhl, a volcano which was active during the Oligocene to the Miocene. The Kaiserstuhl is situated in South Baden, West Germany. These minerals are in weathered marble, which is contact metamorphosed limestone, and which has included biotite, apatite, magnetite (very easy to separate with a magnet) and the rare mineral dysanalyte, which occurs as little black cubes."

One interesting specimen received was dysanalyte, as a black cubic xl in grayish-brown xline limestone. It comes from Kaiserstuhl.

ITALY—A new mineral, called latiumite, has been found in Albano, Latium, Italy. It is a sulphatic potassium-calcium-aluminum silicate, white to glassy material, massive and in elongated tabular xls, found in two ejected blocks of the Alban Hills, associated with hedenbergitic pyroxene, grossularite-andradrite, melilite, leucite, hauyne, and in one specimen also with kaliophilite. Named after Latium—AMERICAN MINERALOGIST, March-April 1954 p. 402 (Walter F. Hunt, Editor, University of Michigan, Ann Arbor, Mich.).

MEXICO—Two very fine specimens of xled orange wulfenite which are almost entirely covered with dark brown vanadinite xls have been donated by the Southern Gem and Mineral Co., 2307 N. Mesa, El Paso, Texas. These come from the Ahumada Mine of Chihuahua, Mexico.

"The wulfenite with vanadinite is a somewhat new material in this area and a relatively small amount of it has been mined."—letter dated Dec. 24, 1953, from M. B. Barron, Secretary-Treasurer of the company.

SCOTLAND—White stilbite, xled and in radiating groups, have been found at Kilmalcolm, Renfrewshire, Scotland.

SOUTH AFRICA — Brownish-black cassiterite xl on pale smoky quartz xl, has been donated by John J. Lavranos, P. O. Box 10257, Johannesburg, South Africa. Both xls have rounded edges as if waterworn and the locality is the Stavoren tin mine, Waterberg district, Transvaal, South Africa.

SPAIN—Very nice brown, partly transparent cleavage of brown sphalerite, has been donated by Juan Montal, Plaza Sgdo. Corazon No. 1, Villafranca del Panades, Spain. This gemmy sphalerite comes from Picos de Europe, Province of Santander, Spain, where it is found in limestone. Good gem quality cleavages of sphalerite are found in only two countries—Spain and Mexico.

Microscope Attachment for long working Distance - Upright Image

A new microscope attachment which provides a 12. 8mms. working distance has just been delivered by its English manufacturer to Edmund Scientific Corporation, Barrington 3, New Jersey, exclusive distributors in this country. The attachment, in two models, 20X and 40X, also erects the image viewed.

Progress in many fields of research in industrial and scientific laboratories has been difficult, if not impossible at times, because of the minimum space restriction between the objective lens of the microscope and the specimen. A great deal more freedom of movement is now possible in dissection, for example. The microscope can now be employed in viewing some surface defects, viewing in crevices and indentations and, an important contribution, viewing specimens at high temperatures.

The system operates well under phase-contrast procedures, making it particularly suited in dessection. Additionally, the erect-image feature eliminates awkwardness in manipulation of specimens, since movements of the hand need not be reversed in relation to the image.

The attachment will fit any standard microscope. It replaces one of the objective lenses, and revolves readily along with the other objectives in the nose-piece. Heart of the system is a half-aluminized plate which first passes light rays then, when they are reflected back to it by a first surface mirror, reflect the lights rays correctly positioned for viewing by the objective. The unit is available in two sizes: the 40X objective with a f/1 of 4 mms. and the 20X objective, with a f/1 of 8 mms.

All agree R & M is tops!

Editor R & M:

I can never write you without telling you of your wonderful magazine. I have organized a small class of interested amateur gem cutters and at least one of them has subscribed.

I could not help but loan my own copies to those interested and all agreed that ROCKS AND MINERALS is better than any of the books published on gem cutting with due respect to the writers.

ROCKS AND MINERALS covers the amateur's needs quite thoroughly, three particular points in mind—sources of gem cutting materials, collection materials in both minerals that fluoresce and those that do not; sands; and specimen material and origins. I could go on mentioning the fine points of ROCKS AND MINERALS, but in summing up, no finer publication is issued for the advanced collector or the amateur.

I wish you much health, happiness and prosperity for the year—54.

R. O. Sharp
Box A 15807, Medical Facility
Terminal Island
San Pedro, Calif.

Jan. 20, 1954

THE SAND COLLECTOR

Conducted by PETER ZODAC, Peekskill, N. Y.

Items on Interesting Sands Wanted. — Please Send Them In.

Garnet sand from Sabino Canyon, Ariz.

From Sabino Canyon, north of Tucson, Pima Co., Ariz., we have a sand sample that was sent us by David P. Record, Mission Curio Mart, 4400 Mission Road, Rt. 3 Box 384, Tucson, Ariz.

This is a medium grained dark reddish sand. It consists chiefly of light to dark red gemmy garnets (pyrope) with black lustrous magnetite. Some white to smoky quartz plus a small amount of green epidote and silvery muscovite also present.

Dust storm sand from California

A sand sample has arrived from California which is such an interesting one that we are glad to describe it in this issue. But first let us read the sender's letter, dated March 11, 1954, which comes from Carl H. Englund, 740 Valencia Mesa Dr., Fullerton, Calif.

"You have by this time hundreds of sand samples sent you by various collectors. But, in the time that I have been reading ROCKS AND MINERALS, I've noticed mention of no samples from a very wide spread source. I refer, of course to the sky.

"In December, 1953, we had three "dust storms" here. (They carry more than dust, however). The sample of very fine uniform sand enclosed was deposited on my car top during the night of Dec. 10-11th. This car was parked in lee of our house in center of an orange grove. The entire country had a thin "dust" film left on it.

"The "dust" storms came via the Cajon and Gargonio passes to the northeast and east of us, and leading into the Mojave and Colorado deserts respectively. Because I've seen the enormous quantities of finely divided material lifted off the deserts by gales, because there is no nearby source of such material, because the quantity of material dropped was so great and because of too great uniformity in size of the sand particles, I am certain in my own mind that this sand is Mojave or Colorado desert material, probably the former. The airline distance into either of these deserts is about 50 miles. The true dust lingered in the air for another day, until a shore wind moved the air away."

As this was the first dust storm ever brought to our attention, we were intensely interested to examine it. It turned out to be an extremely fine grained dark gray sand consisting of three minerals—quartz (smoky, colorless), silvery muscovite, and black magnetite. The magnetite was all lodestone and was present as minutely thin slivers attaching themselves by their ends to the magnet and standing up like tiny bristles.

"Taken from top of car (Dec. 11, 1953). Entire country covered with thin dust film."—on label with the sand.

Geode sand from Florida

"I found a piece of agatized coral on the beach the other day in which there was a small deep hole, the entrance blocked by a little piece of coral. After removing the coral a thin stream of sand ran out which I caught on a piece of white paper. The golden color of it attracted my attention—it was quite a different color to the sand in which the larger piece of agatized coral was lying. I do not know if this will be of any interest to you but am sending it anyway."—letter dated Feb. 23, 1954, from Mrs. J. E. May P. O. Box 97, Brooksville, Fla.

The sample comes from Aripeka, in N. W. Pasco Co., Fla., and it is a very fine grained golden brown sand. It is all brown quartz. The beach is on the Gulf of Mexico.

Magnetite sand from Ontonagon, Mich.

Medium grained black sand. Consists chiefly of lustrous black magnetite with some quartz (colorless, brownish, red-

dish), pink garnet and green epidote. This is an attractive sand as all grains are lustrous and nicely rounded. It was donated by Dr. H. W. Kuhm, 4718 W. Lisbon Ave., Milwaukee 10, Wisc.

"From shore of Lake Superior, Ontonagan (Ontonagon Co.), Mich."—on label.

Lake sand from Lake Norway, Minn.

Lake Norway is in the northwestern part of Kandiyohi Co., Minn. From the shore of this lake we have a sand sample that was sent in by Mrs. Betty McCarty, 5824 E. 12th St., Kansas City 3, Mo. This is a dark gray coarse sand. It consists chiefly of quartz (colorless, smoky, brownish) with feldspar (flesh colored, brownish) and minor amounts of green epidote, pinkish garnet and black magnetite.

Quartz sand from Goldfield, Nev.

Goldfield, in Esmeralda Co., Nev., is a noted mining area. From a wash one mile south of Goldfield, we have a sand sample that was sent in by P. O. Drury, P. O. Box 1028, Las Vegas, Nev.

This is a medium grained dark gray sand. It consists of quartz (colorless, smoky, brown, brown jasper), black magnetite and shale (gray, brown).

Miraculous sand from New Mexico

"Have some sand taken from the shrine at Sancturio which they claim cures all ills when mixed with water and taken as a medicine. Although it might not come under mineral collections I thought I would like to see what it was made of so just had to take a sample. If of interest could send some to you."—letter dated March 18, 1954, from E. M. Graf, P. O. Box 1432, Paterson, N. J. Of course we were interested so a sample was sent up plus another letter, dated April 4, 1954.

"The sand taken from Sancturio has for many years been credited with miraculous cures. I took it to see what was in it.

"To the left of the main altar of the shrine is a small room where a hole was cut out of the concrete floor and the sand taken from this place.

"The shrine is in or near the village of Chimayo (Santa Fe Co.), approximately 40 miles from Santa Fe, New Mexico.

"I cannot guarantee this will cure anyone."

This is a fine grained brownish sand. It consists chiefly of brown marl with a small amount of silvery muscovite and gray chalcedony. (Marl is a soft earthy deposit of calcium carbonate containing more or less clay and sand).

"Shrine erected 1816"—on label.

Lake sand from Lake Maratanza, N. Y.

Lake Maratanza is about one mile east of Cragsmoor, in Ulster Co., N. Y. From the shore of this lake we have a sand sample that was sent us by Mrs. Naomi Garritt, Cragsmore, N. Y. This is a gray, medium grained sand. It is all milky quartz.

"Taken from natural beach, Lake Maratanza, 2,000 feet elevation (2233 feet on U. S. Topo map) on top of the Shawangunk Mts."—on label.

Quartz sand from Athens, Texas

From Athens, Henderson Co., Texas, we have a sand sample that was sent us by Mrs. Ruby Renfro, 2901 Bomar Ave., Fort Worth 3, Texas. This is a medium grained grayish-brown sand. It consists chiefly of colorless quartz (some brownish also present) with some dark brown limonite and a little magnetite which is pitted and stained by iron.

"This sand is from the pit of the Athens Pottery Co. It is the top two feet above the clay. This sand covers the clay all over that part of the country."—on label.

Volcanic dust from Alaska

This is a fine grained dark gray dust from the July 1953 eruption of a nearby volcano which fell on Anchorage, Alaska. Donated by Clyde L. Wilson, M. D., 16 Mont Alto Drive, Jamestown, N. Y.

Beach sand from Bermuda Islands

"This sand is from the west side of Ireland Island and you will find some magnetic particles. This is the only place I noted magnetic material on the beaches, but did not try every beach. You will no doubt find just what this is on inspection."—letter dated Oct. 7, 1953, from Edward Graf, P. O. Box 1432, Paterson, N. J.

Ireland is one of the smaller islands of the Bermuda group. The sample received is a medium grained cream colored sand. It consists of tiny remnants of sea shells and coral, mostly cream and white in color which fluoresce yellowish under long wave light. Some flat grains (lustrous black and rusty black) magnetic material appear to be bits of iron but some may be magnetite.

3 sands from Puerto Penasco, Mexico

Two letters have been received from Ronald L. Ives, P. O. Box 235, Buffalo 21, N.Y. The first, dated July 8, 1953 reads:

"Under separate cover I am sending you three (3) samples of sand from Puerto Penasco, Sonora, Mexico. These were collected for me in connection with other work by Alberto Celaya, Jr., of Puerto Penasco. These probably will make a useful addition to your collection of sands.

"The sample from the beach is a sand which is still forming today, as the beach is slowly building out into the bay. The sample from the dunes is a mixture of late Pleistocene sand and recent material which is still being reworked by the local prevailing winds. The sample from the southeast side of the hill is an ancient sand formed prior to the most recent volcanic activity in the area and probably dated from the early Pleistocene."

The second letter dated Aug. 26, 1953 reads:

"In reply to your letter of August 24, 1953, the high gypsum content of the sands from the southeast side of the hill at Puerto Penasco was duly noted, and analyses indicate that a local plaster industry may be practicable, using sour Maracaibo oil as calcining fuel (brought in by tanker). The Mexican Geological Survey is working on this at present.

"I am not surprised that you have trouble finding Puerto Penasco on the map, as the settlement is less than fifteen years old. Puerto Penasco is a seaport on the Gulf of California, located at the inner edge of Penasco Bay, a part of San Jorge Bay, Punta Penasco is the lava hill above the town, which supports the lighthouse, and shelters the community from Gulf hurricanes. The town is a division point on the new Ferrocarril Intercalifornia del Sur, which connects Mexicali, Baja California del Norte (a new state, just recently organized from the northern part of the old Mexican territory of Baja California) with Benjamin Hill, a new town on the main Nogales-Guaymas Railroad, just south of Sta. Ana, Sonora. Puerto Penasco is also the southern terminus of the Gila Bend, Ajo, Sonoyta and Penasco military road, built jointly by the U. S. and Mexico during the last war for defense purposes, and is an emergency airport community for both armies and Pan-American Airways. It has a weather station, telephones, telegraph, radio relays, and a large fishing and canning industry. Approximate geographical position is Latitude 31° 25′ North; Longitude 114° 35′ West. The local geography is shown with fairly good accuracy of the World Aeronautical Chart, U. S. Sectional Chart Series, Douglas sheet, scale 1/500,000 and to other scales on similar aeronautical charts.

"When circumstances permit, I will try to get you additional sand samples from various locations."

The 3 samples consist of dune, gypsum and shell sands.

The dune sand is cream colored and coarse grained. It comes from the dunes near road about 1 mile inland from the shore. It is made up chiefly of sea shells (white to cream colored) with a small amount of colorless quartz and cream colored gypsum. Some of the shells fluoresce yellow under long wave light.

The gypsum sand is cream colored and coarse grained. It is made up entirely of cream colored gypsum rosettes and comes from southeast of hill in Puerto Penasco.

The shell sand is cream colored and coarse grained. About 95% of it is fine to coarse sea shells of various types, chiefly cream colored but white and pink also present. The remaining material is colorless quartz which is present in tiny rounded grains. Under long wave light some shells fluoresce yellow and some orange. The sand comes from the high tide mark of Penasco Bay.

Pumice sand from Salvador

Salvador (or El Salvador) is the smallest but most densely populated of the Central American Republics. From Presa del Guayabo Chorrera del Rio Lempa (Guayabo Dam at the rapids of the Lempa River) in Salvador we have a sand sample that was sent us by Joseph Schraut Jr., 4125 Fillmore St., St. Louis 16, Mo., who personally collected the sand from the Lempa River.

This river sand is dark gray in color and coarse grained. It consists chiefly of white gray pumice with quartz (smoky, colorless, gray chalcedony), black magnetite, lustrous black hornblende, black biotite, and red to gray quartzite.

Beach sand from Portobello, Scotland

Portobello is on the southern bank of the Firth of Forth, Midlothian County, Scotland. From the beach here we have a sand sample that was collected by Miss Jean Martin, 138 Bridgeness Road, Bo'ness, West Lothian, Scotland.

This is a fine grained dark gray sand. It consists chiefly of guartz (colorless, smoky, some reddish) with pinkish garnet, black coal, and a tiny amount of black magnetite. Some white, also blue, sea shells are also present.

Andalusite sand from South Africa

From the Doorn River of the Marico District of Western Transvaal, South Africa, we have a sand sample that was sent us by Ernest M. Skea, Box 46, Pilgrims Rest, Transvaal, South Africa. This is a coarse dark brown sand. It consists chiefly of dark brown to smoky gray prismatic xls of andalusite (some smoky gray xls are gemmy) with a little smoky quartz and a tiny amount of black magnetite.

The Doorn River is a tributary of the Marico River. So also is Wilgeboom Spruit (Willow Creek). The andalucite sands are found in several streams of the Marico District."—on label.

Volcanic sand from Spain

"I send you small sample of sand from North Spain volcanic area. This sand comes from the volcano's crater and I collected it this past Sunday."—item in letter dated from Nov. 25, 1953, from Juan Montal, Plaza Sagrado Corazon 1, Villafranca del Panades, Spain.

This sample comes from Volcan Roca Negra, Gerona Province, Spain. It is a dark brown fine grained sand consisting chiefly of dark brown lava, with some black augite aand a tiny amount of black magnetite.

Beach sand from Simrishamn, Sweden

Simrishamn is a city in southern Sweden (Skane Province) on the Baltic Sea. From a beach in the city, we have a sand sample that was collected for us by Gerhard Koppen, Skanegatan 3, Nybro, Sweden.

This is a coarse brownish sand. It consists almost entirely of quartz (brownish, colorless, smoky, rock crystal) with feldspar (colorless, reddish, gray). A tiny amount of black magnetite also present.

Beach sand from Trinidad

Trinidad is a British Island off the northern coast of South America. From a beach in Port of Spain, the capital of the island, situated in the northwestern part and on the Gulf of Paria, we have a sand sample sent us by Glen E. Kiser, Douglass, Kansas.

This is a fine grained gray sand consisting entirely of quartz (chiefly colorless but some brownish also present).

Beach sand from Bangor, Ireland

Bangor, Co. Down is on the south shore of Belfast Bay, and is a popular summer resort of Northern Ireland. From the beach at Bangor we have a sand sample that was sent us by Sandy Ramsay, 1015 Aikenhead Rd., Kings Park, Glasgow, S4, Scotland.

This is a dark gray medium grained sand, it consists chiefly of quartz (colorless, smoky, brownish, brown jasper), with a little greenish epidote, black ilmenite, black magnetite. A considerable amount of sea shells (white and blue) are also present.

Sanidine sand from Mexico

In the last issue we mentioned lake sand from Lake Chapala, Mexico's largest lake, which is 70 miles long and 20 miles wide. The sand had been sent us by Alberto E. Maas, Alamos, Sonora, Mexico. We have received another sam-

ple from Mr. Maas. It is labelled "Beach sand from in front of Chapala town on Chapala Lake, Jalisco, Mexico."

This is a dark gray medium grained sand. It consists of quartz (smoky, gray, red chalcedony, red also brown jasper) and considerable colorless, glassy sanidine which has a bluish opalescence. Some dull black magnetite and dark gray basalt also present.

Beach sand from Opononi, New Zealand

"The section of the North Island above Auckland, New Zealand, is referred to as the Northland. The little town of Opononi is located on Hokianga Harbor, which is about two-thirds up the west coast of the Northland. This would be a fine harbor except for the fact that sand bars are always forming in the entrance to the harbor. The hills across from Opononi are being covered with sand dunes where there used to be orchards."—note dated Feb. 1, 1954, from Miss Winifred H. Arnold, 2020 Magnolia Ave., Long Beach 6, Calif., who supplied the following sample.

This is a fine grained brown sand. It consists chiefly of quartz (brown, also colorless) with a tiny amount of black biotite and dull black magnetite.

"Sand bars across entrance to harbor makes the harbor almost useless for shipping lines."—on label.

Hollywood Stars Vermiculite in Quicksand, Explosion Roles

Eight hundred bags of vermiculite were recently used as imitation quicksand by Columbia Pictures in filming "The White Stallion." Other major studios have also used the versatile mineral, mostly as fake rock in explosion scenes.

Edison Used Vermiculite to Catch Napping Watchman

Thomas A. Edison was just about as interested in practical joking as he was in inventing. His joking talent came in handy when he discovered a night watchman at his laboratory often slept on the job.

The inventor acquired a large box of vermiculite, a mica-like mineral which expands tremendously in volume when heated. He placed this box with one end open in a corner of the room where the watchman usually napped, and attached a time fuse to start the minerals expanding at a given hour.

That night cries of fright came from the office. When Edison and an assistant arrived, they found the watchman all but buried alive in the billowing expanding vermiculite. There was no more sleeping on the job after that.

Fossil Department a delight!

Editor R & M:

I have much pleasure and also information reading your interesting magazine. I am delighted with the articles and especially the fossil department and other sections.

Mrs. Winifred Ramsay
1375 W. 158th St.
Vancouver 9, B.C., Canada

April 7,1954

Spreads cheer among Novices!

Editor R & M:

You may be interested to know I have sent one specimen of Wyoming hematite to each of the members listed in the Novice Column (Jan.-Feb. issue).

I have plenty of this Sunrise, Wyo., hematite and this is an opportunity to spread some cheer.

Peter H. Manuel
(Peters Rocks & Minerals)
1031 E. Colfax Ave.
Denver, Colo.

March 29, 1954

Not stingy with space!

Editor R & M:

We enjoy your magazine very much and notice with pleasure that you are not stingy with your space for news.

A. S. Imell, Jr.
838 Clower St.
San Antonion 12, Texas

Feb. 22, 1954

Montana Motel for Collectors!

Editor R & M:

We have a large area of agates in this part of Montana, also petrified wood, jasper, fossils, flint and some Indian relics. Some of the hunters are finding prehistoric animal bones.

We have lived in this part of Montana all of our lives so know the best places and times to hunt the rocks. We operate the Diamond Motel of Terry, Montana and we give this information to all rock collectors (hounds) who stay with us, free of any cost. (This is not a racket.) Our Motel room rates are 1 double bed $4.00; 1½ beds $5.00 and 2 double beds $6.00 with a privilege to cook (no dishes furnished) and completely modern.

The commercial pickers are in this district in April and May. This is the best time of the year to hunt around the hills because of the tall grass later on. We also have a few snakes after May.

If you care to pass this information on to your readers we would appreciate it: I am sure anyone who stops will not be disappointed. We enjoy picking rocks ourselves.

John and Mildred Trask
Diamond Motel,
Terry, Montana

May 1, 1954

MINERAL SHOPPER'S GUIDE

Conducted by CHARLES A. THOMAS
706 Church Street, Royersford, Pa.

Advertisers are invited to send notes or samples of their products. This service is free.

Away back in 1924, we were in the Yellowstone area. At that time, though our interest in minerals was not as accute as it is now, we did bring back some specimens from Wyoming and the Dakotas. Traveling down the Shoshone in those days was a thrill. Custer, too, was a thrill, with its gumbo paved street and its general store well stocked with ten gallon hats and many curios. That night, it rained and the gumbo became a sticky, slippery mass resembling cement. Custer was hospitable and friendly so we stayed there that stormy night. The next morning, the sun finally came out and by eleven A.M., the gumbo, ten or more inches deep, had dried enough for us to start on our way eastward and home. A little while later we stopped and took pictures of Custer's Monument. Still a little further on, we stopped again and took more pictures. Crawling under a single strand wire at the road edge, we roamed afield and picked up blood-red carnelian nearly one-half inch thick, dahlite concretions which resembled petrified sycamore dingledangles and fossil casts of many kinds. The point is this: we kept no record of the exact locality (as we would do now). So travelers, if you come across such an accidental bonanza as this, for goshsakes, take notes and pinpoint the spot on a map.

Gem and mineral specimen dealers, we find, are sensitive to what becomes of their material. We make quite a few understatements, occasionally. At the Merion Mineral Symposium of the Mineralogical Society of Penna. show some weeks ago, we bought a very nice turquoise nodule and stated that we merely wanted it as a souvenir of the show. This understatement caused four chins to drop in openmouthed awe. A souvenir? The drooping chins regained some of their original composure when we introduced ourself and assured them we were kidding and that the turquoise would most certainly be more than a souvenir and would be made into a fine gem. The turquoise weighed close to two ounces and is a perfect piece. Sorry we scared you, Mr. and Mrs. Hamilton and helpers, of Ardmore, Pa.

Every once in a while we receive a few samples of advertised minerals from the Midwest Shop, 9709 S. Prospect, Chicago 43, Ill. This time we received a lovely sprig of native silver from Michigan's Upper Peninsula; a most excellent specimen for mounting in many ways. Also, in the package was a solid chunk of willemite from Franklin, N.J., which is being advertised by the Midwest Shop as slabbed material. Needless to say, the willemite is especially bright in fluorescence. Recent issues of ROCKS AND MINERALS have displayed some very interesting minerals and books in the advertising of this firm. If their prices are so low that they scare you, please do not be hestitant. . . the Midwest Shop material is good.

Augite, in good specimens, seem to be quite rare. John P. Connor of Armour, S. D., sent us a very interesting piece of serpentine full of stout crystals of black, shimmering augite. This material is available. We do not know, at this writing, if the material is for sale or for exchange. We presume that it will be sold to interested collectors. About ten pounds is all that has been found to date.

Peach-pink gypsum in granular masses has been located in Wyoming by Ruel B. Triplett who states that it has been trimmed to 1/2 pound and one pound sizes. We have received a chunk. It has a nice pink color.

We exhibited Charlie Bennett's glass and arborescent nickel among other dealer's items at the Merion show. Nonmineral, to be sure, but very interesting.

Amesite, Chester, Mass.; warwickite,

Edenville, N. Y.; amblygonite in fine crystals, Newry, Me.; and lansfordite nesquehonite, Lansford, Penna., are on the wanted list. If collectors know of duplicates available, please contact the M. S. G.

Some one asked us, in person, if we could locate good brazilianite. We cannot remember who wanted it, but we know for sure, that Schortmann's of Easthampton, Mass., has a neat stock of this lovely mineral in parts of crystals and whole perfect ones at from $1.00 to $10.00. Information is gleaned from their 1954 profusely illustrated catalog. Sixty pages and 37 illustrations list and depict specimens which has made the Schortmann quality known the world over.

Kaapsche Hoop, Grootfontein, Kenya, Tanganyika are African place names which are well represented in the John S. Albanese 1954 catalog. Comparatively rare minerals are listed from other equally interesting world localities. Eskihi-Sher, Asia minor, produces meerschaum of high quality, just to mention one of a great many oddities in the Albanese list.

We note, with some satisfaction, that williamsite is still available in good color, some of which has often matched the best green of imperial jade. Leslie E. Mihm, of 603 Anneslie Road, Baltimore 12, Md., offers this fine williamsite and other eastern cutting materials.

Whether or not you are a beginner in cutting and polishing gem material, we urge you to investigate the ads of Coast Gems and Minerals in ROCKS AND MINERALS. We know, from samples sent us, that their material is most excellent for the amount of money asked for either the rough or the slabbed specimens.

One of the very best ways to learn about your hobby, is to read new and back number copies of periodicals. Philip R. Cosminsky, of 509 Timber Lane, Falls Church, Va., has a perfect set of bound copies of ROCKS AND MINERALS and a large number of other bound sets of out of print periodicals, which see in his ad in the Jan.-Feb. issue of ROCKS AND MINERALS.

If anyone wants to secure "singing ore" from Friedensville Zinc Mines, near Bethlehem, Pa., our best advice is to visit the locality and dig it out. The small pieces in our cellar, kept because of the unusual fluorescence, was not selected for its singing properties which was discovered when we washed large pieces in a tub of water. This material has been distributed to dealers, and a long time ago. The loudest singing comes from pieces weighing five to ten pounds. While giving it a bath, of course, as mentioned in the Jan.-Feb. issue.

There's jade and jade, as everyone knows. Frank Waskey, who is always good copy for this department, has some nice slabs of good green colored jade from the Arctic Shungnak (Jade) River in Alaska. We saw his jade and it is a nice green. See his ads. The prices are so reasonable.

While living the full life, O. Ivan Lee collected a large number of fine minerals. Now that he has passeed on, there is no reason why his fine specimens should remain without benefit to mankind. Burminco, of Monrovia, California, has undertaken to ready this huge collection for sale. Watch for announcements from time to time.

Diamonds do not come in glistening druses on rock or kimberlite. The Southern Gem and Mineral Company does have excellent glistening and lustrous cerussite on lead from Mexico. Good cerussite is a fine dresser-upper for any display cabinet.

Since our modest beginnings with the M. S. G. department, we have, on occasion, mentioned the beautiful daylight green color of Washington fluorite and its glassy lustre. Fluorescent addicts should have a nice sized specimen for their long wave mineral display. The Caribou Lapidary Company can supply excellent green slabs and chunks in all sizes in solid greenish pieces or with matrix which, in the latter, shows a pleasing two-toned pink and blue color under the Purple X lamps. All of this fluorite shows a most vivid blue reaction under the EH 4 lamps and an especially pleasing blue under all balast type lamps such as the self-filtering tubes and the Mineralight SL 3600. Along with splen-

did samples of this fluorite, The Caribou Lapidary Company sent us some vivid pink thulite, some with mottled green, slabbed for the polishers. This lovely pink thulite is just under quartz in hardness and does not necessarily challenge ingenuity to effect a good polish. For those who love to experiment with luminous phenomena, a half-pound package of Washington fluorite chips is packaged for $1.00. The thermoluminescence of this unique fluorite is especially strong in a bright blue colored light. See notes on this unusual light phenomena in this department.

If any pictures appear in this column, the resemblence to persons living or dead is purely coincidental and credit must be given the photographer, Harold Evans. We had nothing to do with the insertion. A color photo would show a nice vein of royal purple fluorite under the pick... if that is the photo selected.

In testing for thermoluminescence, use an electric hot-plate in a very dark room and cover the tiny crumbs or at most one-quarter to one-half inch pieces with a clear pyrex cup. As specimens reach the warm or hot stage, they tend to become shooting stars and a hot one in the eye would be painful. A more elaborate, but simply constructed viewbox with a glass window would be ideal. To discover which mineral crumbs become luminous upon heating is fun. Some give a great show, indeed, and come to luminosity rather quickly. One of the weirdest is certain fluorescent slags which give off a blue light in projected rays, probably due to a sulfur content in which gasses become luminous before reaching anything near incandescent heat. A piece of

Charles H. Priestley (left) Charles A. Thomas (right) digging out a choice crystal at the Blue Ball, Penn., limestone quarry.

Photo by Harold Evans

sulfur rubbed on a moderately hot electrically heated plate will show this luminosity in rather spectacular blue light. There is no doubt that the blue light is hotter than the original heat source. The same may be true of other luminosities ascribed to low heat thermoluminescence. Odoriferous thermoluminescence is inescapable, as Mr. W. H. Hayes will attest. A piece of slag on a hot-plate really fouled up the place. One of the strongest reacting minerals on a hot-plate is Washington green fluorite. A six to eight ounce sprinkling of 1/4" or slightly larger "crumbs" on a hot-plate will give a most vivid show in bluish thermoluminescent light. The light given off is stronger, in most instances, than any cold phosphorescence. While many specimens reach a maximum brightness, then die out, the Washington material, glows steadily at maximum brightness, so long as there is heat and, of course, darkness. Hot-plates should be the regular waffle-pancake making variety which do not get too hot.

It is well known that the faster the grinding wheel wears down, the faster you accomplish shaping of stones. We are experimenting with a new type grinding wheel which accomplishes the fast forming without the usual wearing-down of the wheel. A fast speed with plenty of water is indicated. Any wheel will wear, of course, but some do not disappear too fast. Inquiries will be welcomed from those who like to try new products. This wheel will actually shape corundum types without showing too great wear; something the fast-cutting softer wheels cannot do. Lapidabrade is the trade name. Watch for forthcoming ads and literature.

Lest we forget, Hatfield Goudey, of Gabbs, Nevada, is tops in the field of western micros. Also, his all-black plastic micromount boxes are the neatest we have seen to date. Goudey's micros must meet quality and beauty specifications before being earmarked for sale. Regardless of one's favorite phase of the hobby, one cannot enjoy the full appreciation of Nature's perfection of crystallization, until the acquisition of a microscope is attained and the study of micro-crystallization is made to some extent. Crystal groups are so much more intimate under a good light and a good lens.

Labelon is the ultimate in stick-on tape one can write on and yet it is a smooth plastic. It's a neat trick and so darned fascinating to use, that we are thinking about labeling everything in sight, even the towels in the bathroom. His. . . Hers. . . . A pencil or pencil shaped tool is all that is required. We are thinking also of the many specimens and micromount boxes. It comes in blue or red and in ½", ¾" and 1" wide rolls. Order it from Ward's in Rochester, N.Y. If this isn't the greatest thing in labels. . . well, get a roll and see for yourself.

Use Coaster Wagon, Vermiculite to make Handy Barbecue

With spring and the outdoor living season coming up, folks will be taking to the out-of-doors for their evening meal, most likely prepared the barbecue way. The Zonolite Company, Chicago, suggests making a portable barbecue wagon this way:

Borrow your children's coaster wagon and line the bottom with about two inches of vermiculite. Place a grate across the sides and you're in business.

The vermiculite directs the heat upward, protects the wagon, and absorbs the meat drippings. For best cooking results, barbecue over glowing embers, never over a high flame. (This vermiculite mentioned here is the processed variety, not the crude mica).

Exploring for Oil by the Radioactivity Association Technique

Upon request of readers of your publication, the RADIAC CO. INC. 489 Fifth Avenue, (42nd Street) New York City 17, New York, will furnish free literature concerning the use of Geiger and Scintillation Counters in the exploration for oil by means of radioactivity association technique.

The following reprints are available:

1 "Radioactivity in Geophysical Oil Search" Oil Forum, March '53.

2 "Now They're Hunting Oil With Atomic Guns" Popular Mechanics '53.

3 "Atomic Tools Seen Opening New Era in Geological Exploration" Texas Oil Journal — October '52.

THE AMATEUR LAPIDARY

Conducted by COMMANDER JOHN SINKANKAS
Certified Gemologist, American Gem Society
1107 S. Oakcrest Road, Arlington, Va.
Amateur and professional lapidaries are cordially invited to submit contributions and so make this department of interest to all.

CHARGING A COPPER LAP WITH DIAMOND DUST

Copper cutting laps for faceting have proved so spectacularly successful that their use has practically superseded the old method of using loose carbo grits for grinding purposes. Although loose grits are extremely useful for many purposes still, the copper lap presents some advantages which simply cannot be ignored. First, there is the matter of "messiness", copper is clean and the only particles of grit which may cause trouble by getting into bearings or contaminating polishing agents are those created by the grinding process itself. Since these are extremely fine and are washed off as quickly as they are generated, little trouble from this cause is encountered in practice. Furthermore, grit sizes can be changed by merely flipping over the copper lap and using the other side which is customarily charged with a different grit. No additional containers for abrasives are needed with the copper lap, a well-charged one will last for a long time, offering the maximum in sheer convenience. In practically all respects, the copper cutting lap is the equal if not the superior to loose grit laps. In this article I will give you the techniques which I have found to be eminently successful and highly economical.

DIAMOND GRIT SIZES — I have found two grit sizes to be most useful for all-around cutting from the tiniest, softest stones to the largest "knuckle-duster" sizes of step-cuts. For coarse cutting especially useful for large stones, 400 grit combines the features of rapid materal removal with a finish smooth enough to permit 'touching-up' with the second size grit. This second size is 1200, very fine, somewhat slow if used alone in stones of substantial size but leaving an absolutely fine finish for polishing. This grit is gentle enough in its action to cut the softest materials without imposing severe strains on it while doing so. Larger harder stones are pre-cut on the 400 and then smoothed on the 1200.

COPPER LAPS—The best size for a cutting lap is 8" in diameter, 6" may be unduly restrictive while anything larger will seldom be used all over for cutting. The lap should be of fairly pure copper, at least ¼" thick, and *machined* flat and parallel! This is important. Thinner laps tend to "work", that is the pressure placed on them by the dopped stone is apt to cause the copper to flow and develop depressions and in extreme cases, to actually curl up like a very shallow dish. For this reason thin sheet copper is not useful unless it can be sweated perfectly to a thicker disc of another metal, a process scarcely worth the trouble involved. Once obtained, safeguard your copper disc from bumps, scratches, and deformation, all of which can happen easily enough.

PRINCIPLES INVOLVED — Diamond dust has a peculiar affinity for copper, actually only the pressure of the thumb nail is needed to get particles to bite in and subsequent efforts to dislodge same only result in sinking the diamond further. This statement is a note of warning not to let any dust fall upon a copper lap accidentally, if it does, tip it up and gently brush off the dust with a small soft brush, do not use your fingers! This happy affinity of diamond for copper is what makes this combination so successful, well-imbedded diamond will stay in place for fantastically long periods of time and more often than not, is removed only by mechanical scraping such as often

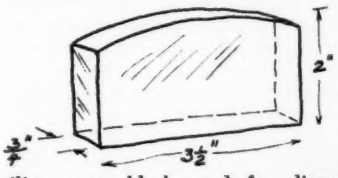
occurs by carelessly lowering a sharp bit of rough to the lap while it is in motion. The process of charging is broken down into several steps: (1) oiling, (2) powder distribution, (3) driving-in.

OILING THE LAP — In order to distribute the dust scientifically over the useful area of the lap, it must be first coated with a vegetable oil to provide a suspending medium for the diamond. If diamond powder is sprinkled over a dry lap, it will surely bunch up in spots and any attempt to distribute with the fingers will merely result in patchy cutting which in turn will mean that lean spots in the lap will wear away at a faster rate than spots which are richly charged. This bad state of affairs soon leads to bumpy and irregular laps which enormously increase the difficulties in polishing.

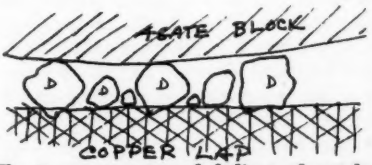
Any vegetable salad oil is about as good as the expensive olive oil which has been customarily used for this purpose. Using an eye-dropper, place drops of oil evenly over the surface using about 12 drops. Rub these with you finger until a perfectly uniform film of oil is present. If the oil is sloppy wet, take some off, the lap must be moist but not excessively so. If too little has been put on, add a few more drops and re-spread.

POWDER DISTRIBUTION — Take a vial of the selected size of diamond powder and tip it sideways and rotate to work the powder up to the mouth, dribble tiny specks uniformly over the surface being sure that each speck is no larger than the head of a pin and that no more than 8 to 10 such specks are placed on an 8" lap. Use too little powder at first until you get the hang of it, my experience has shown that about 1/8th carat will charge an 8" lap successfully. It isn't how much powder you use which counts so much as it is how well it is distributed. Now using the very tip of your forefinger, *gently* push the powder about in circular motions until it is as evenly spread about as possible. Use the lightest of pressure to avoid sinking in the grains, this will come later, our chief purpose here is merely to get them in position for driving in. Be particularly careful to avoid putting too much powder near the center of the lap and not enough near the edge, both faults are common. Avoid putting powder right next to the center nut hole, this area is seldom used. Do be sure to run the powder out to the edge of the disc.

DRIVING IN THE POWDER — The secret of success in driving in diamond dust is in the type of tool used for this purpose, there is nothing superior to a hard, compact piece of agate for this purpose. The agate I use is the ordinary gray-Brazilian material which is noted for its toughness, I have found none better. A block of agate is cut about 3½" in length, about ¾" in width and about 2" in height. One of the long and narrow sides is then ground down into a rocker shape, this surface is the one applied to the lap to drive the dust in. Do not use a flat block because a moment's reflection will show you that the pressure you can exert on the dust is proportionate to the area of the block used to drive it in. If say a square flat block is used, the pressure exerted on one particle of dust is practically nil while if the rounded rocker type of charging block is used, the pressure is simply enormous because only a single thin line of the whole agate is actually in contact with the lap surface. Furthermore, the wedging action of the curved block traps the powder relentless-



Brazilian agate block used for diamond charging.



Why it pays to get graded diamond powder. As you can see, you pay for the small particles but only the large ones are driven in!

ly, forces it down into the lap and then finally drives it in under enormous pressure to complete the job. Steel rollers are poor for charging because although they work on the same principle as the agate block described, suffer from the fact they too get charged with diamond which then crushes the dust already on the lap and makes a mixed mess of varying grit sizes. This is merely wasteful.

In use, the agate block is applied to the surface of the lap with a hard scrubbing motion. The lap is not rotated during this process. All conceivable directions are used while scrubbing and all areas covered and re-covered. Keep this up for at least 15 minutes or until your fore arm is tired. Use about 10 lbs. downward pressure, be sure the lap is resting on a flat non-skid surface meanwhile. Remember not to rest it on the same work-spot when charging another sized grit, insert a clean bit of paper underneath first. After the scrubbing is complete, place the lap on the master plate and rotate by power. Scrub again by letting the agate ride on the spinning lap, slow speeds are best. Keep the agate continually rocking to avoid grinding a flat spot on the rocker surface. A few minutes of this "clean-up" operation will be enough. You can check your efficiency by picking up a drop of oil on a glass slip and examining it with a 10 xl glass or under a low-powered microscope. The oil will be a dirty brown from the countless fine particles of copper suspended in it but the typically gray or whitish bits of diamond should be conspicuous by their absence.

When the lap is well-charged, clean off the oil with lighter fluid and the lap is ready for use.

TWO RARE MINERALS FROM MEXICO

Washington, D. C., Jan. 22, 1954 — Two hitherto unknown minerals, probably among the rarest materials in the earth's crust, have just been described by Smithsonian Institution mineralogists.

One, reported to the Geological Society of America at its recent meeting by Dr. George Switzer, is a combination of the elements zinc, antimony, and oxygen and occurs in minute glassy-brown crystals found in tin deposits in the Mexican province of Guanajuato. It has been named ordonezite in honor of the late Dr. Ezequiel Ordonez, eminent Mexican geologist.

Something of the sort was suspected by Smithsonian mineralogists some years ago when the presence of antimony was revealed by chemical analysis in melted tin. The search for it and its identification, however, were long, involved procedures. Dr. Switzer now has obtained approximately a quarter of a pound in a pure state.

A still rarer and more curious new mineral, identified by Dr. William F. Foshag, Smithsonian head curator of geology, is mosesite, a combination of mercury, nitrogen, chlorine, and water occurring in in the form of small yellow crystals. Actually an extremely minute quantity of this was found in Texas about 40 years ago. It was recognized as a new mineral, but a sufficient quantity for analysis was not found at the time. Then it was rediscovered in Mexico by Dr. Foshag.

It represents, says Dr. Foshag, a combination of elements never found in mineral form before. The nitrogen molecule is an ion hooked to mercury in a type of chemical bond not hitherto known in nature. Thus mosesite might conceivably be the prototype of a family of extremely rare minerals as yet undiscovered.

R & M improving with age!

Editor R & M:

Rocks and Minerals like wine is improving with age.

J. H Bertrand
301 N. 10th St.
Easton, Pa.

April 2, 1954

FOSSIL DEPARTMENT

Conducted by A. ALLEN GRAFFHAM

Box 419, Ardmore, Oklahoma

FOSSIL COLLECTING NEAR BUFFALO, N. Y.

By ALLEN STOIBER

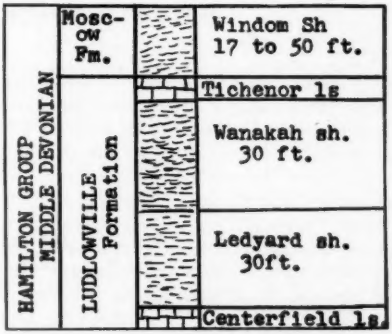
One of my favorite collecting localities is along Buffalo Creek, near Elma, N. Y. The fossils found here are of Devonian age. A map of the area and the section exposed is reproduced here.

Starting upstream from the Girdle road bridge there is a shale bank three to six feet high along the creek on the left side. This outcrops for several hundred yards, and is a rather barren outcrop of the Wanakah member of the Ludlowville formation. In one spot however, excellent specimens of the brachiopod *Mucrospirifer mucronatus* can be found.

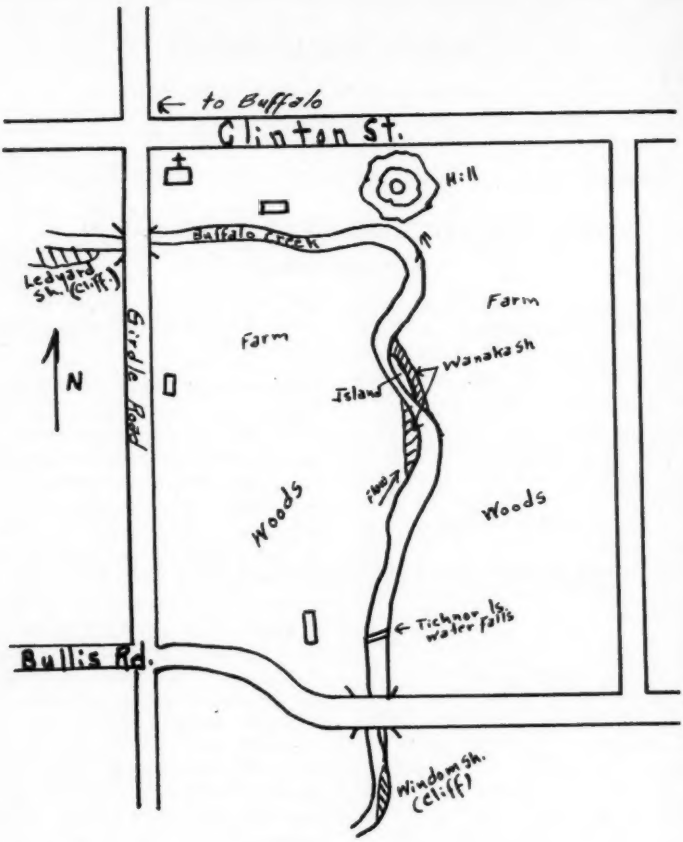
About a quarter of a mile upstream, there is a shale exposure for about 200 feet along the edge of the creek. Many types of invertebrate fossils are found here in abundance. There are numerous brachiopods, bryozoans, corals, and an occasional trilobite, cephalopod or crinoid. Some of the most common brachiopods are: *Athyris spiriferoides, Atrypa reticularis, Ambocoelia umbonata, Spinocyrtia granulosa,* and *Brachyspirifer audaculus.* There are at least twenty other types of less common brachiopods which are occasionally found here. The corals *Heliophyllum halli, Stereolasma rectum,* and *Pleurodictyum stylopora* are found here. The crinoid root *Ankyrocrinus bulbosus,* the trilobite *Phacops rana,* and the pteropod *Styolina fissunella* are found along with many other fossils too numerous to list here. This outcrop is also the Wanakah shale.

Another quarter of a mile upstream, the Tichenor limestone is exposed. It is a very hard lime and fossils can only be collected with a great deal of effort and heavy tools. The fauna is like the Wanakah, with some pelecypods such as *Aviculopecten* and *Plethomytilus* being more common.

Downstream from the Bullis road bridge, high cliffs of the Windom shale of the Moscow Formation rise on the left side of the creek. Next to the water, you will note a bed of *Ambocoelia umbonata* at eye level. It takes only a few minutes to collect several dozen of these from the loose shale. About a hundred yards on downstream the cliffs flatten out. It is here that a number of trilobites can be found. Five species of trilobites occur here. *Phacops rana* and *Greenops boothi* are quite common, while *Dechinella rowi* and *D. maerocephalus* are less common. *Dipleurus dekayi* is found here but it is extremely rare. To my knowledge only one perfect specimen has been found. To date I have found one head, and body fragments of others. This locality will usually produce five or six complete trilobites and numerous parts of others.



Geologic section exposed along Buffalo Creek near Elma, N. Y.



Map of Fossil localities on Buffalo Creek near Elma, N. Y.

A large portion of my collection has been found at the above mentioned localities along Buffalo creek. At least 100 species have been reported from this area and I now have about 30. I have 133 identified species and numerous unidentified forms in my entire collection. I am at present building up my collection by exchanging with other collectors. One of my aims is to have fossils from every state in the union. This however, may take some time, as I now have thirty-nine to go.

I have had a request for a list of really elementary books on the subject of fossils. It is very unfortunate but as far as I know there is not one really elemental text which covers this subject. There is a publication of the New York State Museum on the fossils of New York State which is very good. I do not know if this book is still in print or not, but interested parties could write the museum at Albany, N. Y., for information. There are two works, which unfortunately are rather expensive, that completely cover

the common fossils of the United States. They are as follows:

"Index Fossils of North America"
Shimer and Shrock $20
"Invertebrate Fossils"
Moore, Lalicker, and Fisher $12

The following letter was received from Clarence M. Jenni of Los Angeles, California.

You might be interested in a collecting area not too far from your home that is near to being the best overall fossil collecting area in the U. S., due to the fact that in a fifty mile area nearly all of the major formations known to science are exposed and most of them very fossiliferous. The area I speak of is from Kimmswick, Mo., south through Perry Co., Mo. An almost complete geological series from the Pre-cambrian (Pilot Knob area) to glacial drift near Festus- Crystal City. At Glen Park, near Kimmswick (Jefferson County), there is a limestone quarry that has a large exposure of the Kimmswick formation of middle Ordovician age, above which there are several feet of Silurian, then Fern Glen of Mississippian age which is capped by Burlington Limestone. All of these are highly fossiliferous especially the Kimmswick, where I collected about 200 complete trilobites, including an eight inch *Isotelus gigas* in about five years of collecting.

Many other fine specimens are to be obtained here including a large variety of sponge *Receptaculites*. South of here in Perry county, the early Mississippian rocks and some Silurian are exposed and offer excellent collecting. In St. Genevieve County, there is a faulted area, where the University of Chicago conducts a summer school and here in addition to the Ordovician, Silurian and Devonian are well exposed.

Just south of Festus the lower Ordovician with some Cambrian is exposed and in spots many well preserved fossils are to be found. These include some primitive trilobites (Jefferson City Limestone) and some primitive gastropods.

North of Festus the plattin, Decorah and Joachim offer many apecies.

In about five years I collected some 20,000 specimens from this area, the whole of which I gave to the Walker Museum at the University of Chicago.

New Model 963 Scintiliometer 290 Times More Sensitive Than Geiger Type Counters

The Radiac Company, Inc., 489 Fifth Avenue, New York 17, New York, announces the new Model 693 Scintillometer, developed particularly for use in geological survey work such as uranium prospecting, exploration for oil, and prospecting for non-radioactive minerals associated with uranium. It is used for making production checks in radioactive ore processing and for field and laboratory radioactive ore assaying. Some non-geophysical uses of the Scintillometer are civil defense radiation monitoring and personnel training, general health-physics contamination monitoring, and isotope tracing in industry. The high sensitivity and wide range of energy response makes the 963 Scintillomete scienttfically suited to these varied applications.

The Model 963 Scintillometer rapidly and accurately detects and measures gamma radiation within wide limits under extended ranges of temperature and humidity. Developed after four years of manufacture and research in the field of nucleonics, the new Model 963 Scintillometer incorporates numerous innovations and improvements over the original Model 939 Scintillometer, which was the first scintillation survey meter to be manufactured, and which is now in world-wide prospecting use.

The new Scintillomter can be used for prospecting on foot, from a moving vehicle and from low flying aircraft. The Model 963, which comes provided with an adjustable shoulder strap, is contour shaped in order to sling comfortably against the body. It is built to withstand the most rigorous field conditions.

Upon request, the Radiac Company will forward literature explaining the use of the Scintillometer for oil, uranium, and associated non-radioactive mineral prospecting by means of the radioactivity anomalies technique.

R & M has no peer!

Editor R & M:

I am a recent subscriber for your magazine and must say that I think it is magnificent It truly has no peer in this field!

Gerald O. Robbins
P. O. Box 531
Stockton, Calif.

March 22, 1954

IS AMERICA'S OLDEST LIME QUARRY IN RHODE ISLAND?

It may be of interest to the readers of ROCKS AND MINERALS to learn, or to disprove, that the first limestone to be quarried and burned in America was in 1662 at Manton, four miles west of Providence, Rhode Island.

Mr. J. Leander, Bishop, in "A History of American Manufactures from 1608-1860" (vol. 1, p. 218), writes, "The earliest mention of its (lime's) manufacture that we have seen, was in Rhode Island, where, in January, 1662, a Mr. Hacklet, of Providence, applied to the town for liberty to burn lime, and to take stone and wood from the commons for that purpose, which was granted him for a limited time". The Providence Early Records contains the following, "—as Hackelton making his request unto the Towne—have liberty to burne lime upon the Comon neere about—and to take stones and wood for the same purpose—by vote that he may have liberty until—next and no longer" (Providence Early Records 3.8, Jan, 27, 1662, p. 266).

The disagreement about the spelling of the name, Hacklet versus Hackelton may be due to the poor quality of the writing. There is no record of any early settler of Rhode Island by the name of Hacklet, Hackelton, Hackington, etc., and it has been suggested that this was a fictitious person, such as John Doe or G. I. Joe (Sidney S. Rider (1904), "The Lands of Rhode Island as They Were Known to Caunounicus and Miantunnomu when Roger Williams Came in 1636", pp. 269-270).

There has been disagreement also concerning the location of this earliest lime quarry, some favoring the quarries at Limerock, seven miles almost north of Providence and formerly in Smithfield. The disagreement seems to have been satisfactorily resolved in favor of the Manton locality, however, by Rider who concluded, after considerable argument, "I hold that Hackelton's Lime Rock was, and now is, on lands known in recent times as the Nathan Brown Farm, four miles from Providence", (p. 270).

Dr. Charles T. Jackson contributed his bit by writing, "I visited the farm of Mr. Nathan Brown, four miles from Providence, and there examined an extensive bed of limestone which was wrought for lime before the discovery of the Smithfield lime-rocks." (Jackson, 1840, "Report on the Geological and Agricultural Survey of the State of Rhode Island", p. 80).

The Providence Sunday Journal of April 3, 1904, contains a photograph of the kiln, then in good condition and with a cherry tree growing in it. A search in this area in 1953 revealed no remains of the kiln; presumably it was torn down for the purpose of obtaining stones for use in the construction of some of the nearby houses. The small quarry, which was supposed to have been a third of a mile from the kiln, is still recognizable, although it is much overgrown and partly filled with rubbish. The limy material is a marble bed within the Blackstone series, which here consists mainly of quartz-chlorite schist and which has been tentatively assigned to the pre-Cambrian. Present meager exposures suggest that the bed is probably not over ten or fifteen feet thick.

I will be pleased to receive any evidence, for, or against, accepting this as the earliest-worked lime quarry in America.

Alonzo W. Quinn
Department of Geology
Brown University
Providence 12, R. I.

– NOVICE COLUMN –

In the Sept.-Oct. 1953 R&M, Gordon ViGario, 2231 Pine St., Bakersfield, Calif. suggested that a Novice Column be opened for rank beginners in mineral collecting. These amateurs, who do not know one mineral from another, may submit their names to the Novice Column.

It is our hope that collectors having duplicates may donate a few specimens to one or more novices who are expected to acknowledge receipt of specimens received and to reimburse each sender for postage paid on the packages. Please print or write plainly the names and localities of all specimens sent novices, and if 2 or more minerals appear on the same specimen, identify each. Remember the novices do not know one mineral from another, so please be as helpful as you can.

The following is the fourth list of novice collectors:

Miss Grace Mary Kearney, 3604 Clifton Ave., Baltimore 16, Md.

Peggy Nielsen, 8 Mohican Pk., Dobbs Ferry, N. Y.

Carolyn E. Hollis, RFD. #1 Dudley St., Marlboro, Mass.

Mrs. Elizabeth Ozawa, 145 North Vernon Ave., Pasadena 3, Calif.

Mrs. Mary B. Adkins, 90 E. Division St., North East, Pa.

Peter Neil, 90 E. Division St., North East, Pa. (7½ Yrs. old)

S. Injeski, 1432 N. Humboldt Ave., Milwaukee 2, Wis.

Michael Papcun, RR #1, Melrose, Iowa

Mrs. R. A. Du Mont, 20 Newbury St., Boston, Mass.

James M. Cole, 20 Harvard St., Natick, Mass.

R. W. Kraft, 61 Glasgow Terrace, Mahwah, N. J.

David Aiken, 3818 Earl St., Fort Worth 11, Texas. (9 Yrs. old)

Sherman K. Locke, Dublin Rd., Richmond, Mass. (12 Yrs. old)

Jane Schulze, 136 Norfeld Blvd., Elmont, N. Y. (11 Yrs. old)

Myron Sherman, 735 N. W. 13th St., Miami, Fla.

Gary Favro, 340 Cornelia St., Plattsburgh, N. Y.

Steven Johnson, RFD. #2, Amherst, Mass. (14 Yrs. old)

Mr. and Mrs. R. P. Holden, 1101 Cleckler, Fort Worth 11, Texas.

William James Harding, 239 Wood St., East Palestine, Ohio.

Wants more trip articles!

Editor R & M:

Enclosed find check for $3 to renew my subscription for 1 year. I would like very much to see more articles like the wonderful story (complete with mileage) of your trip to Colorado.

John Wolf
4209 Ethland Ave.
April 25, 1954 Baltimore 7, Md.

Municipal Engineers Journal

The 4th quarterly issue for 1953 carried a most interesting article, "Geology of the New York City's Water Supply System, A Progress Report", by Thomas W. Fluhr, pp 125-145, 11 figs. The Journal is published quarterly by the Municipal Engineers of the City of New York, 29 W. 39th St., New York, N. Y. Subscription price $2.00 per year or 50c per copy.

Looking Back . . .

Twenty-Five Years Ago in ROCKS AND MINERALS

June 1929 Issue

Diamonds in the United States, by Eugene W. Blank, pp. 37-40. The first of a series of interesting articles on diamonds in the United States by Mr. Blank who is still with us.

Little journeys to old mineral shops, by Albert C. Bates, pp. 40-41. This was the beginning of an interesting series of articles on dealers and collectors that flourished many years ago.

How Overbrook, Pa., was put on the map in 1905, by T. J. Lewis, pp. 42-43. Mr. Lewis described many quartz crystals that he found at the locality.

A compilation of Gem Names, by Gilbert Hart, pp. 48-49. A continuation of the longest list of gem names ever printed up to 1929.

A review of mineral collecting during 1928, pp. 50-53. Short notes by dealers and collectors.

Club and Society Notes

Attention Secretaries—Please submit neat copies. Give dates and places of meetings. Check names for correct spelling.

East

Mineral Society of Pennsylvania Field Trip

On Sunday, April 4th, 1954 our field trip committee planned a visit to the dumps of the historic Wheatley Mines at Phoenixville near William's Corner, Pennsylvania.

125 members and friends attended led by "Boz" and Jimmy Irvine Jr., Clay Hamilton and Charley Thomas. Samuel Hamilton whose ancestors mined the metal there in the 1600's and made it into coins and who in 1918 unwatered the Chester County lode identified the minerals and interpreted the geology.

Some good specimens of pyromorphite, sphalerite, galena, cerussite, mimetite and large doubly terminated quartz crystals were found.

Members staked a claim on a hill and dug in. Bobby Eisenhauer staked a claim between two old timers and came home with a better haul than his dad.

It was a lovely day, and friendship and golden sunshine mixed to fill everyone with a healthy glow, signaling the end of winter and the promise of spring.

Second Symposium of the Mineralogical of Pennsylvania

A cold pouring rain did not dampen the enthusiasm of the 550 people from four states and the District of Columbia who attended the Second Mineral Symposium of the Min-

Mineralogical Society of Pennsylvania field trip to the Wheatley dumps at William's Corner, 2 miles south of Phoenixville, Pa.

Photo by Harold Evans

eralogical Society of Pennsylvania at the Merion War Tribute House, Merion, Pennsylvania on March 14th, 1954.

The fine exhibits were so numerous and interestingly arranged that visitors who had been there all day left with a feeling that they had missed many superb minerals.

The refreshment bar in the lounge where Mrs. Stephens of the Nestle Coffee Company of Camden, New Jersey, graciously served the expensive brew, housed the exhibit of cake gems which was the sweetest and assuredly the most popular at the symposium. They were contributed by the feminine members of the society and served by a charming committee composed of Bea Hickson, Elizabeth Kiersnowski, Betty Jester, Martha Irvine, Ruth Eisenhauer, Ginny Duersmith, Clara Thomas, Betty Bell, Evelyn Loux, and Martha Hopkins, headed by Florence Evans and Gerry Shulman.

Also in the lounge was an Eastern Federation-type case of superb New Jersey minerals sent by the Newark Mineralogical Society and arranged by Newark's president, Gene Vitali ably assisted by member, Russell DeRoo.

In the Legion Room, Ellen Davidson and Ellen Pietsch displayed their hand wrought jewelry and gems. In the lapidary workship Ellen Pietsch and Vinc Rodgers were kept busy making gem stones into jewelry as visitors obtained stones from Ernest and Dagmar Beissinger of Pittsburg and C. C. Hamilton of Philadelphia who had outstanding commercial exhibits. The necessary silver was obtained from T. B. Hagstoz and Son of Philadelphia.

David Evans and Ethel Hanson demonstrated the gem faceter assisted by Lief Hanson, proving that even a child could help facet stones.

John H. Gibson interestingy demonstrated the complicated chemical analysis of minerals and sourdough, Frank Waskey of Alaska and Maryland showed a most interesting collection of antique Eskimo jade and ivory artifacts.

In the entrance hall guests were greeted by the friendly smiles of registrars Lulah Ranck and Caroline Lord. Here also Ludwig Koelnau presided over a busy swapping corner and was a vertiable fountain of information on the minerals concerned.

In the ballroom the Philadelphia Book Company displayed a most complete collection ot earth science hobby books. Samuel Hamilton had a fine commercial exhibit of diamond drills, cores and geologic maps and John Anthony displayed unusual commercial gem stones and settings.

The Junior section had some unique exhibits: Bobby Donley's Cornwall miniatures made many an adult envious, Emilyjo Bauhof's Blue Ball mineral Merry-go-round was cute. Arthur Diamond and Carol Triem had showy

General view in main room
Second Mineral Symposium of the Mineralogical Society of Pennsylvania

Photo by Harold Evans

exhibits and "Boz" and Jimmie Irvine Junior's Wheatley exhibit inspired the club's next trip. Eugene Orner teamed with his father Ray to show a fine and amazingly complete collection of minerals from the Cornwall Iron Mines of Lebanon County.

In the adult mineral section, Chairman Charles Thomas did his usual excellent job producing super-fine museum material exhibited by himself, Wesley Crozier, Ray Orner, Gerry & Will Shulman, Paul Loux, Floyd Faux,, Gene Belz and Russ DeRoo.

The Franklin and Marshall Museum sent a wonderful exhibit of agates set up by Len Duersmith, curator of minerals and assistant curator, Harry Ranck. Dr. John Price of Franklin and Marshall set up a most complete paleontology exhibit and Jerry Gelston's cherrywood case of fossils was interesting as was the little diamond he'd found in Arkansas the month before.

Ken Fisher had an amazingly complete Franklin collection and identified Franklin specimens for all comers. Charley Owens as usual had an outstanding radioactive display while Jim Hart sold and swapped radioactive and rare earth minerals.

Edna and Bill Hunt, Gus Silversparre and Paul Seel set up their microscopes and demonstrated micro mounts and how to make them.

Florence Evans portrayed the safety rules with a huge graphic poster. Julie Reed with the cooperation of Bryn Mawr College put on a fine geology exhibit answering all questions with authority.

Behind the curtain on the stage John Kuppinger and Harold Evans showed a breathtaking exhibit of fluorescent minerals to the never-ending stream of visitors who filed by to see it all day.

The Wagner Free Institute of Science gave an educational exhibit. Williams Brown and Earle presented mineral equipment in poster form. The Edmunds Scientific Company showed some fine microscopes and demonstrated how to get more fun from collecting by the use of optical instruments.

The lapidary section gave a really professional showing. Charles Thomas who always comes up with some unique artistry again exhibited his shadow box frames with driftwood and polished stones and a new departure, combining black wrought iron and polished stones. Walter and Lois Lawn presented a case of fine jewelry. Leonard Morgan showed his polished carnelian and beryl. Betty Hirst showed her silver wrapped baraques and Gene Belz showed her buttons and superb cabochons. Frank Bozelli's master touch was demonstrated in his case of rare faceted stones. Joshua Howell displayed a collection of jade, carnelian and ivory from the Orient. Harold, Florence and David Evans entered their gems and originally designed jewelry.

Russ Bell's display of crystals, rough gem material and polished stones were beautiful and his jewelry and gem identification instruments were educational. Robert Block's sculptured rocks were most interesting.

Bill Hunt, Charley Owens and Paul Seel inspired by lovely Edna Hunt did a fine lighting job thus helping the members and visitors to see an outstanding mineral show and come away impressed by the prevailing spirit of cooperation, enthusiasm and the beauty of the exhibits.

By popular demand plans are being made for the next symposium to be held when the workers recover their strength.

Gerry & Will Shulman, Co-chairmen
Publicity Committee, M. S. P.
113 Huntington Terrace, Newark 8, N. J.

Boston Mineral Club issues Bulletins

The Boston Mineral Club has inaugarated a series of location bulletins covering interesting mineral localities. Three have been issued to date, the last one being on Gillette Quarry in Haddam Neck, Conn. (6 pp. with map and 5 drawings). These very fine location bulletins are offered collectors at 25c each. All collectors residing in the New England area or who are planning to visit there should have these bulletins. Send your orders to the President of the Club, Gerald F. Krumm, 35 Pleasant St., Newton Center 39, Mass.

New York Mineralogical Club, Inc.

The January meeting was held at Schermerhorn Hall, Columbia University, New York City, on January 20, 1954, approximately 75 members attended.

Dr. Frederick Stenbuck, President presided and called the meeting to order at 8 P. M.

Dr. Stenbuck announced that one of our oldest members, Mr. John N. Trainer, passed away in December. A minute of silence was observed in tribute to his memory and the Secretary was instructed to send a letter of sympathy to Mrs. Trainer.

In view of the fact that our club has for a long time received the courtesy of free usage of this room from the Dept. of Geology, Dr. Stenbuck suggested that a new and much needed projection screen be purchased from club funds and presented to the Columbia University Dept. of Geology as a token of our appreciation in kind.

A motion was made by Mr. Curt Segeler that a sum not to exceed $100.00 be used from the club's funds to purchase a screen for the Geology Dept. The motion was seconded by Mrs. Bernadette Marcin and unanimously passed. The purchase was so ordered by the President.

It was announced that the meeting room was available to the members for swap, discussion, identification of specimens from 7:30 to 8 P. M. sharp.

A note from Mrs. Thomas was received and read to the membership. She stated it is about time for the club to visit the Philadelphia Science Museum again.

The program followed. Dr. Ralph J. Holmes of the Dept. of Geology, Columbia University, lectured on Geology and Minerals of Somalia, Africa.

Dr. Holmes stated that from the standpoint of mineral collecting, Somalia was a good place to stay away from. The remarkably fine color slides of this little known part of the Dark Continent emphasized this statement repeatedly. Few roads, little water, lots of long and short Somali's, both kinds spending the better part of their lives seeking or hauling water from filthy wells. It was a most interesting geological travelogue even if minerals were conspicuous by their absence. It was a fine lecture and Dr. Holmes was well applauded.

The meeting was adjourned at 10:38 P.M.

Victor Pribil
Secretary
47-18 37th Street
Long Island City 1, N. Y.

North Jersey Mineralogical Society

Why the mineral collecting localities of Canada differ so widely from those of the United States, particularly those of New England, was explained to members of the North Jersey Mineralogical Society by Curt Segeler of Queens Mineral Society, a practicing mineralogist. He was guest speaker at the April meeting of the local society held in Paterson Museum.

During the past summer Mr. and Mrs. Segeler with their son and guests took an extensive collecting trip through Massachusetts, New Hampshire, Ontario and Quebec, and brought back a wealth of good specimens. He illustrated his talk with a group of these and with color slides showing them in place in the mines and quarries.

The New England pegmatites, he said, are chemically acidic and are characterized by a great deal of quartz. They contain also various acid elements, hence they produce tourmaline, beryl, garnet; the lithia minerals: spodumene, lepidolite and amblygonite; the phosphate minerals in so many varieties that several of them have not yet been analyzed and named.

The Canadian pegmatites have alkaline bases, largely limestone and ferro-magnesian minerals. They yield nepheline, sodalite, scapolite, zircon, cyrtolite, thorite, allanite calcium phosphates, calcium feldspars and iron minerals.

The 15-minute mineral study period was conducted by Wesley Hayes who took tungsten as his subject. He named and described the several ores from which it comes and showed samples of scheelite and wolframite which he had collected at the Trumbull, Conn., location, with others which come from other tungsten sources.

The leader for May will be Walter Dallery.

Marian B. Casperson
Publicity Chairman
9-11 Hamilton St.
Paterson 1, N. J.

Queens Mineral Society

For the past 17 years, our little group of Mineralogists of Long Island, known as the Queens Mineral Society, has had an annual dinner. This year, this event was on April 6th and as usual, it was a friendly get-together in one of the restaurants of our community. The speaker, Mr. V. Pribil, one of the Club members, took us on a mineral tour through Northern United States, Canada and the Gaspe peninsula, all these interesting spots, we covered via colored slides. Displayed for all to see, were beautiful specimens of beryl collected last summer on this trip by Mr. Pribil. However, we too are contemplating a little trip . . . The next one scheduled by the Field Trip Committee will be to . . . Somerville, New Jersey, at the beginning of the month of May. Just a few miles from home, but when a mineralogist discovers good specimens, he is happy, no matter where they come from, be it far or near.

The Club had several meetings in the past few months on a interesting topic, namely 'Spectroscopy'. Mr. Frank A. Lewis, a club member, discussed analytical spectroscopy and at a later meeting, the use of the spectroscope. At our next meeting, the subejct will be the Miscroscope.

M. L. McKay, Secretary
111-20 106 Street
Ozone Park, L. I.
New York

South

Southern Appalachian Mineral Society

Asheville, N. C.

The Southern Appalachian Mineral Society of Asheville, N. C., has inaugurated one of the most ambitious field trip programs ever brought to our attention. At least 2 field trips every month, (January and December omitted) will be held this year covering localities in North and South Carolina, Virginia and Tennessee. Write-ups on the localities to be visited, what may be found there, with sketch maps showing how to reach them are mailed regularly to members.

A letter, dated March 8, 1954, from the President of the Society, has these two paragraphs:

"We are sending you a tentative schedule of field trips that this Society hopes to have this year. It is an ambitious program and more or less of an experiment. We held our first trip without incident and there were around 30 present.

"Have added your name to our mailing list, so that you will be kept informed of the doings of our growing mineral society."

Orville M. Hewitt
Colonel USA Ret'd
6 E. Forest Road, Biltmore Forest, Asheville, N. C.

Bexar County Mineral Hobby Club

On February 26th, the Bexar County Mineral Hobby Club met in the rock shop of the Robert George's for a social meeting. Mrs. Pat Bowling, one of our members, gave a talk to the 32 in attendance on "Opals". She used a type of projector to demonstrate the various types of opal and related subjects. Mr. Art Lawson, another member, will give a talk dealing with "The Facts and Fantasies of Rocks" at the March 26th meeting in the home of the George's, 369 Dwight Ave., San Antonio, Texas.

We have a membership now of 41 paid adult members.

Mrs. Arthur S. Imell, Jr
Secretary, Bexar County
Mineral Hobby Club
838 Clower St.
San Antonio, Texas

Mid-West

Black Hills Mineral Society

The Black Hills Mineral Society met in their club room in City Hall Friday, February 12, 1954. It was decided at this meeting to become a member of the Rocky Mountain Federation of Mineral Societies. Plans were made for Swap Night to be held in the club room on Friday night, February 26.

The main feature of the evening was the showing of colored slides of rocks and minerals of Oregon and other western states. These were shown by Lawrence Jones and narrated by Mrs. Carl Reinhold. Also, Jack Zasadil of Hermosa exhibited trays of cabochons of jade, moss agates, Fairburn agates and many others which he himself had made.

The next meeting will be known as "Cycad Night" with William Sloan of Piedmont in charge; the date—March 12, 8:00 P. M. Anyone interested is welcome to come to any of our meetings which are held the second Friday night of each month.

Mrs. Fred Hammerquist
Corresponding Secretary
Box 904
Rapid City, S. D.

Chicago Rocks and Minerals Society

March Meeting

On the evening of March 13th, the members and guests of Chicago Rocks and Minerals, Society were entertained by a society member, Mr. Clell Brentlinger, also an official of Western Union. The speaker of the evening gave a clear picture of the ocean bottoms—usually flat as a table, because of the absence of usual eroding agents—wind and weathering.

In the black and icy depths—usually near freezing—strange fish and animals swim above the silt and sand packed floor of the sea. Sample specimen have been taken of the ocean floor, sometimes at a depth of 3 miles, with a sea-bottom cannon, a torpedo-like affair lowered to the sea bottom and driven into the sand and silt floor by a cartridge discharge.

After being brought to surface, the tube is cut away exposing a ten foot strata specimen for analysis, and considering that the sea bottom sediment is laid at the rate of one foot in 20 years, a ten foot tube reveals oceanic history of the last 200 years.

April Meeting

On the evening of April 10th, the Chicago Rocks and Minerals Society was entertained by a lecture and movies on the "Earth As A Planet". The speaker of the evening was Dr. Ben Hur Wilson, eminent lecturer, Editor in Chief of the Earth Science Digest, Past President of the American Federation of Mineralogical and Geological Societies, and also has been instructor of Geology at Joliet Jr. College.

Many rock hounds and other persons interested in geology will know Dr. Wilson as co-author of "Quartz Family Minerals"

The talk was delightful and at the conclusion of it a beautiful handcrafted watchfob was presented to the speaker by our president, Mrs. Helen Cooks.

Chicago Rocks & Mineral Society
3618 No. Page Avenue
Chicago 34, Illinois

Rochester Earth Science Society

The Rochester Earth Science Society heard an interesting talk at its March meeting by Mr. George P. Netherly of the Minnesota Mining and Manufacturing Co. of St. Paul. The subject was "Abrasives". Mr. Netherly traced the history of the use of abrasives and discussed the various materials used for abrasives and for backings.

On April 5 Mr. William F. Brunia of the Gem Cutters Supply Co. of Des Moines, Iowa, brought lapidary equipment for display and demonstration. The meeting was held in Parkhill Brothers garage. 127 members and nonmembers attended. The machinery was in operation and people who had brought rocks had a chance to saw, grind, and polish. Mr. Brunia, also, displayed cut stones, jewelry findings, and books on lapidary subjects which were for sale.

At the present time the Rochester Earth Science Society is sponsoring a course at the Rochester Evening Community College. The subject is *Geology and Rocks of Some of our National Parks*. The course is being given by Dr. Duncan Stewart, Jr., Chairman of the Geology Dept., Carleton College, Northfield, Minn. and consists of six lectures.

Mrs. Dana Rogers
Corresponding Secretary
820-10½ St. S.W.
Rochester, Minn.

Rocky Mountains

Dugway Gem and Mineral Society

The Dugway Gem and Mineral Society at Dugway Proving Ground voted at the January 12th meeting to take advantage of the opportunity of affiliating with the Rocky Mountain Federation of Mineral Societies. We are now looking forward to their Annual Convention to be held in Salt Lake City on June 11th, 12th and 13th.

On Saturday, February 27th, a group of about 30 Dugway rockhounds made a field trip to the Geode Bed located about 44 miles from the Post off the Fish Springs-Callao Road. After much strenuous digging, despite a cold wind, numerous whole geodes were uncovered ranging from walnut to large coconut size. On the whole the trip proved to be a great success.

Mrs. John E. Alder
Secretary
RW Division
Dugway Proving Ground
Dugway, Utah

Albuquerque Gem and Mineral Club

Our new year started January 25 with the prospects of being a very successful one. We now have 76 members for this year and have had wonderful talks on "Uranium", "Turquoise", "The Use of Mineral Deposits & Gem Materials by Prehistoric Southwesterners" at the previous meetings and a field trip that was terrific, about 40 cars and 100 or more people participated in this event.

At our annual meeting of January 25, 1954, the following officers were elected:

Dean Wise—President, re-elected
Arnold Buzzalini—Vice President
Charles A. Tucker—Recording Secretary
Catherine Kunz—Treasurer
Ellen C. Wood—Corresp Secre'y, re-elected

Ellen C. Wood
Corresponding Secretary
9114 Fairbanks, N. E.
Albuquerque, New Mexico

Mineralogical Society of Arizona

At the Feb. 5th meeting of the Mineralogical Society of Arizona, Arthur L. Flagg talked on associated minerals of Arizona, covering a list compiled by the Arizona Bureau of Mines of primary, secondary, and contact metamorphic minerals and those found in pegmatite dykes.

In general the world over there are certain associations of minerals which prevail, he said, but like any other rule we try to formulate, there are exceptions. The setting or association in all localities are not always the same.

In Arizona the best specimens come from secondary ore deposits. They are the alteration products of original ores and are close enough to the surface that oxidation gives them interesting colors. However, there are 10 minerals from the Jerome mines which are drab and hard to identify. They were developed by the burning of a sulphide ore body which burned for 50 years.

At the Feb. 19th program, Harry and Ruth Crockett, well known Arizona bird authorities, presented a program of motion pictures in colors of Arizona birds. Numerous of the 445 species recorded in Arizona were shown in action. The tiny Inca doves, common in all Arizona yards, emigrated here from Texas about 40 years ago, said Harry Crockett. 19 species of hummingbirds have been recorded in the United States and of this number, 14 have been found in Arizona.

Dr. H. H. Ninninger of Sedona explained how to find a meteorite when seen to fall. A 20 mile circle is mapped around the supposed spot. People on at least 3 sides are interviewed. The area is then reduced with similar interviews. The final core area of about 10 miles will be elliptical, and the meteorite fragments very difficult to find. If noise is not heard when a meteor is seen to burst, it is several miles high. Most meteorites burn out before reaching the earth.

Dr. Ninninger is nationally known for his many years of research work on meteorites.

Barney Barnard, owner of the B bar B Ranch in the Superstition Mountains, was host to the MSOA on their Feb. field trip. After a visit to the old Goldfield mine, the caravan of 17 automobiles had lunch at the Barnard ranch where Mr. Barnard related stories of his 40 years in the Superstition Mountains and legends of the Lost Dutchman Mine.

Ida Smith,
Publicity Correspondent
2010 West Jefferson,
Phoenix, Arizona

Wasatch Gem Society

Wasatch Gem Society of Salt Lake City, Utah, held their election of officers at their annual dinner held at Andy's Smorgasbord, 3350 Highland Drive, Saturday evening, January 23rd, and the following were elected:

A. J. Paul—President
T. H. O'Neal—Vice President
Mrs. W. H. Sayler—Secretary
K. O. Stewart—Treasurer
Board of Directors:
Henry T. Fisher
Stewart Romney
Dr. B. D. Bennion
Howard A. Hanks

Mrs. W. H. Saylor, Sec.
6400 South 9th East
Salt Lake City, Utah

West

Del Norte Rockhounds

Through the special efforts of our new president, Mrs. N. N. Sondergard, aided by our tireless secretary, Gertrude C. Penn, the Del Norte Rockhounds were shown slides from various rock hunting trips to the California, Arizona and Utah deserts, on the Mar. 12th meeting, with 17 guests and 29 members present.

At the April 9th meeting slides were shown of plume and saginetic agates. These later slides are a part of a prize-winning collection belonging to Luhr Jensen, President of the Yachats, Oregon, Gem Club. The club has purchased these slides and through the courtesy of Si Labarsky, our past president, these slides were shown in his projector. 21 visitors were present at the April 9th meeting as well as 23 members.

The meetings are held in the Crescent-Elk school basement the second Friday of each month.

Wm. C. Chandler
1465 Pacific Ave.
Crescent City, Calif.

2nd Annual Gem & Mineral Show
Aug. 13, 14, 15, 1954

Committee heads for the Second Annual Gem and Mineral Show have been appointed and plans are now underway for feature exhibits and displays by member clubs of the Lapidary Association, which is sponsoring the show. Show is being held at the Shrine Convention Hall in Los Angeles on August 13, 14 and 15.

Co-chairmen are A. B. Meiklejohn, of the Los Angeles Lapidary Society, and Thomas S. Warren, of the American Gem and Mineral Suppliers Association. Treasurer is W. A. Stephenson, of the Hollywood Lapidary Society.

Committee heads include Ted Schroeder, Display and Awards chairman; R. E. Nowak, Publicity, R. R. Jester, Special Features and Protection; Della Holbrook, Hospitality and Registrations; Elizabeth Tamblyn, Floral, Decorative and Field Trip; C. E. Hamilton, Grab Bag; Tom Kneeland, Program; and John E. Gaston, Working Lapidary committee chairman.

Members of the committees represent the four clubs in the Lapidary Association which are hosting this year's show — Los Angeles Lapidary Society, Hollywood Lapidary Society, the Gem Cutters Guild and the Santa Monica Gemological Society.

Other clubs in the Lapidary Association who are participating in the show and whose members will display their work include the Glendale Lapidary and Gem Society, the Pasadena Lapidary Society, the San Pedro Lapidary and Gem Society, the Compton Gem and Mineral Club, the Long Beach Mineral and Gem Society, the Delvers Gem and Mineral Society and the San Gabriel Valley Lapidary Society.

Theme selected for this year's show is "Working Hobby—Minerals to Gems", and the process of transforming a drab uninteresting specimen into a beautiful set gem will be illustrated in displays and working exhibits.

The large exhibition area offered by the Shrine, its central location and exceptionally good parking facilities along with the high qualities of both special and amateur displays are expected to make the 1954 show one of finest and best attended ever held.

Pacific Mineral Society

Some of the utilitarian as well as the beauteous aspects of the favorite copper were ably presented by Dr. P. A. Foster, M. D., a Past President of the group, at the February meeting.

Copper plays an important part in Biochemistry. Black sheep may turn white, when copper is insufficient, and the assimilation of iron by the body is dependent on the presence of copper. The incidence of copper in the system increases thirty times in pregnancy.

Many metallurgical processes are dependent on this mineral; the sad state of the chromium on some of the recent cars is due to the shortage, as copper was a highly strategic need.

The splendid colored slides demonstrated that the entire spectrum is represented in the many copper minerals. The variety of forms that copper assumes was well illustrated—the wire, the platy, the rosette, mushroom, arborescent, dendritic, sheet copper and the six sided nail.

All of the continents except Asia share in the presence of this valuable metal, which occurs as a secondary enrichment when native.

Many pseudomorphs were shown—malachite after calcium or azurite and some phosphates, the latter called pseudomalachite.

We saw pictures of many of the rare ores —plancheite from Hungary wittichenite, a bismuth compound, and klaprotholite.

The display of copper minerals was furnished by Mr. Harold Eales from his extensive collection. The chalcotrcite, chrysocolla, covellite and linarite were especially beautiful.

The Bisbee, Arizona, operations are now reaching the oxidized zone and should yield many excellent specimens. It is encouraging that copper deposits have recently been located from the air, this may have good future possibilities.

The Pacific's monthly field trips have been successful and well attended this year. Mr. Hecox has been the Director. At this time President Guy Morris handed the gavel over to Mr. Russell Doakes, and the membership is confident of another successful year.

B. Royer, Reporter
1234 W. 41st St.
Los Angeles 37, Calif.

Mineralogical Society of Southern California, Inc.

At the February meeting of the Mineralogical Society of Southern California, Mr. Meral W. Hinshaw took the members on a tour of the Kimberley and Premier diamond mines of South Africa, illustrating his talk with colored slides, showing methods of sorting and processing the diamonds. He also discussed some of their industrial uses.

At the March meeting Dr. George Tunnel, one of the leading crystallographers of the United States, spoke to the members and friends of the MSSC on "The Development of Crystallography in Relation to Mineralogy". He gave the historical story of the advance of this study from 1665 to the present time and showed how a particular system which he has developed and which will be in a book he is writing on the subject, will help make the identification of crystals a somewhat simpler matter. Dr. Tunnel is also well known in the fields of mineralogy and geology — as a Fellow and Past President of the Mineralogical Society of America and Associate Editor of the American Mineralogist for the past eighteen (18) years. He is also a Fellow of the Geological Society of America and was President of that body in 1944.

Mrs. Milton A. Wise
1162 Woodbury Road
Pasadena 6, Calif.

The Los Angeles Lapidary Society

In February Dr. Richard H. Swift gave the Los Angeles Lapidary Society another one of his fine talks on the ancient Near-East concerning the history and Lapidary Arts of Assyria, Babylon and Mesopotamia.

Nell Stein
6110 Rimpau Blvd.
Los Angeles 43, Calif.

The Los Angeles Mineralogical Society

Dr. Thomas Clements, Dean of the University of Southern California Geology Department, spoke to The Los Angeles Mineralogical Society, in February, about recent scientific research on the GEOLOGY OF DEATH VALLEY.

Features common to deserts are divided into types and almost all of them are found in Death Valley. Desert mountains are classified according to the particular type of rock: igneous, granitic, volcanic, sedimentary and metamorphic. Fossils indicating Paleozoic Age are found in mountains of the Death Valley area. There is evidence that movement has been taking place for the last million years and is still going on.

Recent geodetic surveys have located three places in the central part of Death Valley which are 283 feet below sea level. Formerly it was believed that Bad Water, El.—279.8, was the lowest spot.

Alluvial fans, playa, salt flats, sand dunes, washes, badlands and lake beds are all pronounced features of Death Valley. Erosion due to rainfall and draining water cause considerable changes.

Dr. Clements discovered evidence of prehistoric man having lived in Death Valley. Tools of an Ice Age culture have been found in the beds of Lake Manly. Parts of a mastodon tusk recently uncovered indicates the area once had vegetation to support man and animals of the Pleistocene Period.

Lucile Thomas
228 So. Oxford Ave.
Los Angeles 4, Calif.

North Lincoln Agate Society

The 12th annual Agate Show sponsored by the North Lincoln Agate Society will be held on July 24 & 25, at the grade school in Delake, Oregon. Amateur collections, featuring a wide variety of rocks from the Oregon beaches, as well as several commercial displays will be exhibited. A grinding and polishing demonstration will run continuously during the show.

The hours will be from 10 A. M. to 10 P . M. on Saturday, July 24, and from 10 A. M. to 6 P. M. on Sunday, July 25. Admission will be a dime.

T. W. Abendroth
Box 36, Taft, Ore.

Roxy Ann Gem and Mineral Club

Listed below are the 1954 officers of the Roxy Ann Gem and Mineral Club of Medford, Oregon. We meet at the Girl's Community Club on the second Friday of each month at 7:30 P.M.

L. A. Mentzer—President
Mr. Harry Marx—Vice President
Mrs. Florence Renaker—Secretary
Mrs. Eva Duggan—Treasurer

While the Oregon hills are drying from the winter rains the Roxy Ann Gem and Mineral Club of Medford, Ore., took a field trip around town to visit local collections. Their exhibits covered Indian artifacts, general mineral collections, sun colored glass, geodes as well as all the local agates, dendritic, plume, moss, iris and sagenite. The work shops were of equal interest, from saws to laps to sphere making machines.

Mrs. George Renaker, Secy.
1102 W. 10th St.
Medford, Oregon

Columbian Geological Society

The Columbian Geological Society of Spokane, Wash., held open house on April 1, 1954, at the Finch Arboretum. 24 exhibits were displayed by members and two guest clubs the North Idaho Mineral Club and the Inland Empire Rockhounds.

Fossils, arrowheads, minerals, fluorescent and cut and polished specimens were exhibited; colored slides were also shown. Paul Brannon and Clark E. Harris were in charge of arrangements.

Dorothy S. Osborn
2812 East Fifth
Spokane, Wash.

OBITUARY NOTICES

EDGAR H. SARLES

(Aug. 1, 1878 - Jan. 13, 1954)

Edgar H. Sarles was born on August 1, 1878, in Brooklyn, New York; the son of a Baptist Minister, and departed this life January 13, 1954.

Mr. Sarles, who spent many years as a resident of Cincinnati, Ohio, lived his early life in a village in New Jersey. Here he obtained his early schooling in public and private schools. Then after five years in a college preparatory, he attended and graduated from Rutgers College in 1899, with a B. S. in Chemistry.

Mr. Sarles in these years was very active in church affairs and continued thru his long productive life to follow and live the teachings of Christ. In school and college he participated and excelled in many sports.

His interest in mineralogy and earth sciences started at an early age, with many trips on foot and on bicycle to famous New Jersey locations, furnishing the beginnings of sixty years of collecting and study. At the age of 12 he built a fine large mineral cabinet to house his collection, which endures as a tribute to his industry to this day.

Among his early achievements as a collector and student were his discovery of metallic silver in New Jersey, a new species of trilobite in the Devonian Rocks of New York state, and later the discovery of a significant deposit of Bauxite in Southern Ohio.

Mr. Sarles served in many responsible positions with large chemical companies in the middle west and finally in Cincinnati. He is credited with many discoveries and processes in this field. His work in recent years with cobalt compounds as Chief Chemist of Shepard Chemical Co. places this company as a leader in the complex and important field.

Edgar H. Sarles, the man, was without equal, in the opinion of his friends, who numbered in the thousands throughout the world. He gave freely his time, his knowledge and efforts to everyone in a fashion to deprive himself of many things. His first consideration was always the needs and problems of his friends.

In Cincinnati thru his leadership, knowledge and perseverance, there developed a group of amateur geologists and mineralogists, which culminated in two organizations: "The Dry Dredgers" and "The Cincinnati Mineral Society". The former devoted to Paleontology and the latter to the study of Mineralogy. The passing of Edgar H. Sarles leaves a stirring challenge to these two groups to emulate the teachings and philosophy of their founder.

Mr. Sarles, over sixty years built up a fine collection of study minerals from all over the United States and foreign countries. Most

Edgar H. Sarles collecting at Mundy's Landing, Ky.

Photo taken Aug. 20, 1950

were obtained by personal collecting at times when transportation was a real problem. This made him thoroughly intimate with well known and obscure localities. In the Tri-state area of Ohio-Indiana-Kentucky he was undoubtedly without peer as to discovering minerals and localities.

His library consisting of some thousand texts and bulletins are a tribute to his insatiable desire for finding out the how and why of the innumerable phases of the earth sciences. Having found out he was a veritable encyclopedia of information to his many friends. Times without number he went to great pains to investigate, analyze and interpret any question or problem posed to him, or identifying some unknown specimen presented for examination.

Mr. Sarles was an active member of the following organizations: The Norwood Baptist Church, Ohio Academy of Science, Cincinnati Natural History Museum Association, The Cincinnati Mineral Society, The Dry Dredgers, Rocks and Minerals Association, Rutgers University Alumni; and many other organizations of similar nature. In all of these groups he held offices of responsibility.

Mr. Sarles is survived by his widow Mrs. Minnie Sarles, two daughters, Mrs. Fred Schatz, Mrs. Ruth Benedict and a son Mr. Wesley Sarles.

Charles L. Gschwind

Junius J. Hayes
(Oct. 20, 1885 - Feb. 27, 1954)

Moab, Utah—Junius John Hayes, 68, a member of the University of Utah faculty for 25 years, died Saturday night while driving his automobile on U.S. Highway 160 near Moab Airport, when he apparently suffered a heart attack.

Grand County Sheriff Robert C. Burr, who investigated, said that Mr. Hayes' chest was crushed in the accident, but a physician determined the heart attack to be the cause of death.

Injured in the mishap were two passengers, Victor Sourby, 21, and Kenneth Williams, no age listed, both of Levan. The vehicle went out of control and traveled 450 feet off the road before striking a post.

Made Attempt

Mr. Williams attempted to take the steering wheel from Mr. Hayes but was unable to do so. He suffered head and shoulder bruises and lacerations. Mr. Sourby's right arm was fractured.

Prof. Hayes, assistant professor emeritus of mathematics and astronomy at the University of Utah at the time of his death, retired from the faculty three years ago. For the past several years he had engaged in civil engineering work.

He had served as president of the Mineralogical Society of Utah from 1940-49 and in 1947 he was president of the newly created Rocky Mountain Federation of Mineralogical Societies. He was also president of the American Federation of Mineralogical Societies.

The former university teacher was a member of the Wasatch Gem Society and a member and former president of the Astronomical Society of Utah. He also held membership in the Utah Academy of Sciences, Arts and Letters, Utah Audubon Society, and the Rocks and Minerals Association.

Pleasant Grove Native

Native of Pleasant Grove, he was born Oct. 20, 1885, a son of Isaac and Rose Brown Hayes. He was graduated from Brigham Young University in 1907 and from the University of Utah in 1911. He attended the University of Chicago in 1934.

Before becoming affiliated with the university, Mr. Hayes taught and was principal in high schools in Pleasant Grove, Kanab and Richfield (all in Utah) for 10 years.

He married Genevieve Spilsbury on Aug. 28, 1912, in the Salt Lake Temple, Church of Jesus Christ of Latter-day Saints. He was active in scouting.

While a resident of Pleasant Grove he served two terms as mayor, was a member of the Alpine District School Board for four years, president of the Pleasant Grove Commercial Club six years and president of the Pleasant Grove Farm Bureau for six years.

Survivors Listed

Surviving in addition to his widow are five sons and daughters, John K. and Robert D. Hayes, Provo; David R. Hayes, New York City; Mrs. H. Theodore Sumsion, Schenectady, N. Y., and Mrs. C. Wallace Dalley, Salt Lake City; his mother; two brothers and a half sister, Claud E. and Isaac R. Hayes and Mrs. Rose Bartlett, all of Salt Lake City and nine grandchildren—Desert News, Salt Lake City, Utah, March 1, 1954.

HOMER A. DAVIES DIES

Editor R & M:

It is with deep sorrow that I write this note to notify you of the passing of my Dad, Mr. Homer A. Davis, Sand Collector, on the morning of April 3rd at the age of 62.

Through his hobby of collecting sand he made many friends. Most of whom he never met face to face, but he gained much pleasure and satisfaction from their aquaintance.

He was a shy and sincere man and above all he was modest. He did not seek out recognition for his strange and interesting hobby, but over the years it caught up with him. Through those who saw his painstaking work with his sand, people from the four corners of the earth contacted him and offered to add to his growing collection. Newspapermen came to him for interviews and published write-ups in papers from coast to coast.

It is tragic that he should be taken from his work at this time when the full rewards seemed so close at hand, but our Creator has commanded it to be. The results of almost twenty-three years of his work remain. It is the wish of my Mother and I that this work be continued as a memorial to him. His hobby was so very much a part of him.

I myself shall do all in my power to carry on where he left off. It was his wish that I do so. We shall call it The Homer A. Davis Memorial Collection of Sands.

I hope that I may keep contact with you and Rocks and Minerals for years to come. Dad kept all the issues you sent him and glancing through I became quite interested in the Sand Collectors section. I know of no other publication that covers sand collecting on such a scale. It's great.

George H. Davis
524 Putnam Ave.
Cambridge 39, Mass.

Rev. R. B. Owens
(July 9, 1871 - Jan. 14, 1954)

Long a prominent figure in the Episcopal Diocese of North Carolina, the Rev. Robert Bruce Owens, 82, of 1508 South Blvd., who served 29 years as rector of the Church of the Holy Comforter, Charlotte, N. C., died early yesterday morning in a Charlotte hospital.

Before his retirement Dec. 31, last, he was in the ministry of the Protestant Episcopal Church 53 years.

The venerable minister also possessed talent as a wood carver. Another hobby which he enjoyed was that of collecting North Carolina gems, which he polished and classified. His collection included approximately 2,500 gems.—Charlotte Observer Jan. 15, 1954.

Publications Recently Received

Arizona Publication

Rare and Radioactive Minerals, by Richard T. Moore, 40 pps., 1 fig. Issued as Bull. 163 by the University of Arizona, Tucson, Ariz. Price 30c (free to residents of Arizona).

New Hampshire Publications

Clays of Southeastern New Hampshire, by Lawrence Goldthwait, 15 pp., 2 maps.

Geology of the Sunapee Quadrangle, New Hampshire, by Alonzo Quinn, 24 pp., 1 pl., 1 pl., 6 figs., 1 map.

Geology of the Wolfeboro Quadrangle, New Hampshire, by Alonzo Quinn, 24 pp., 1 pl., 9 figs., 1 map.

These publications are issued by the State Planning and Development Commission, Concord, N. H.

Pennsylvania Publication

The Minerals of Lancaster County (3rd Ed.), by Herbert H. Beck, 13 pp., 1 map. Published by the Linnaean Society of Lancaster County, Lancaster, Pa.

Vermont Publication

Geology of the Rutland Area, Vermont, by William F. Brace, 124 pp., 12 figs., 13 pls. Published by Vermont Development Commission, Montpelier, Vt. as Bull. 6 (1953).

Virginia Publications

Virginia Mineral Localities, by Richard V. Dietrich, 57 pp., Price 50c.

Virginia Minerals and Rocks, by Richard V. Dietrich, 63 pp., Price 75c.

These two very interesting publications were recently published by Virginia Polytechnic Institute, Blacksburg, Va.

Canada Publications

Geology of the Brudenell-Raglan Area, Ontario, by D. F. Hewitt, 123 pp., 19 ills., 10 sketch maps.

Asbestos in Ontario, by D. F. Hewitt and J. Satterly, 23 pp., 5 ills., 1 map.

List of Publications (revised to October, 1953) 60 pp., 1 map.

The publications are issued by the Department of Mines, Parliament Bldg., Toronto 2, Ont., Canada.

Japan Publication

Mineralogical Journal, September 1953, Vol. 1, No. 1, 68 pp., illus.

This is the first issue of a magazine on minerals, printed in English, by the Mineralogical Society of Japan (Department of Geology and Mineralogy, Faculty of Science, Hokkaido University, Sapporo, Japan). Price per copy $1.00.

See item on p. 511, Sept-Oct. 1953 R & M relative to the Mineralogical Society of Japan.

CATALOGS

Burminco's Specimens from O. Ivan Lee Collection

A list of 321 selected specimens from the famous O. Ivan Lee Mineral Collection is offered collectors. This long list takes up 8 pages. The specimens are for sale by Burminco, 128 S. Encinitas Ave., Monrovia, Calif. If interested write for the list.

Geode Industries 1954 Price List

Geode Industries, 411 Main St., New London, Iowa, have issued a 3 page price list on geodes. This concern specializes in geodes and so they carry a huge stock of all types and sizes. Send for their price list today.

Minerals Unlimited Issues Fine Mineral List

Minerals Unlimited, 1724 University Ave., Berkeley 4, Calif., have issued a 6 page price list covering fine mineral specimens. The minerals come from all over the world. If you are interested in fine minerals, get a copy of this new price list.

Plummer's Issue New Price List

Plummer's Minerals, 4720 Point Loma Ave., San Diego 7, Calif., have issued a 6-page price list covering choice mineral specimens, rough gem material, etc. Their list is free. Send for it!

Schortmann's Catalog No. 10

Schortmann's Minerals, 6 and 10 McKinley Ave., Easthampton, Mass., recently issued their brand new catalog (No. 10). This is a very attractive publication of 60 pages, profusely illustrated and with a golden-yellow cover. The catalog features choice minerals, fluorescent minerals, radio-active minerals, books, supplies, etc. To help defray printing costs and postage, a charge of 50c is made for the catalog; however a special coupon will be enclosed that can be redeemed for 50c on your order amounting to $4.00 or more.

National Speleological Society Publication

The Origin of Helictites, by George W. Moore.

Helictites are elongated cave deposits similar in some regards to stalactites, but differing from stalactites in that they are curved and develop in apparent disregard to gravity. This interesting paper of 16 pages, 9 figs., has been issued by the National Speleological Society, 3047 S. Columbus St., Fairlington, Arlington, Va. Price 45c.